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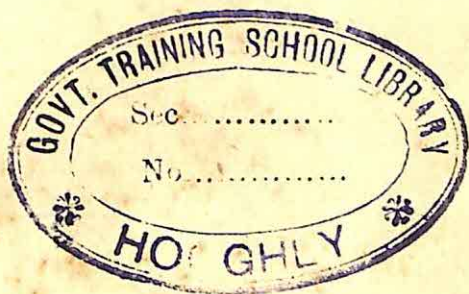


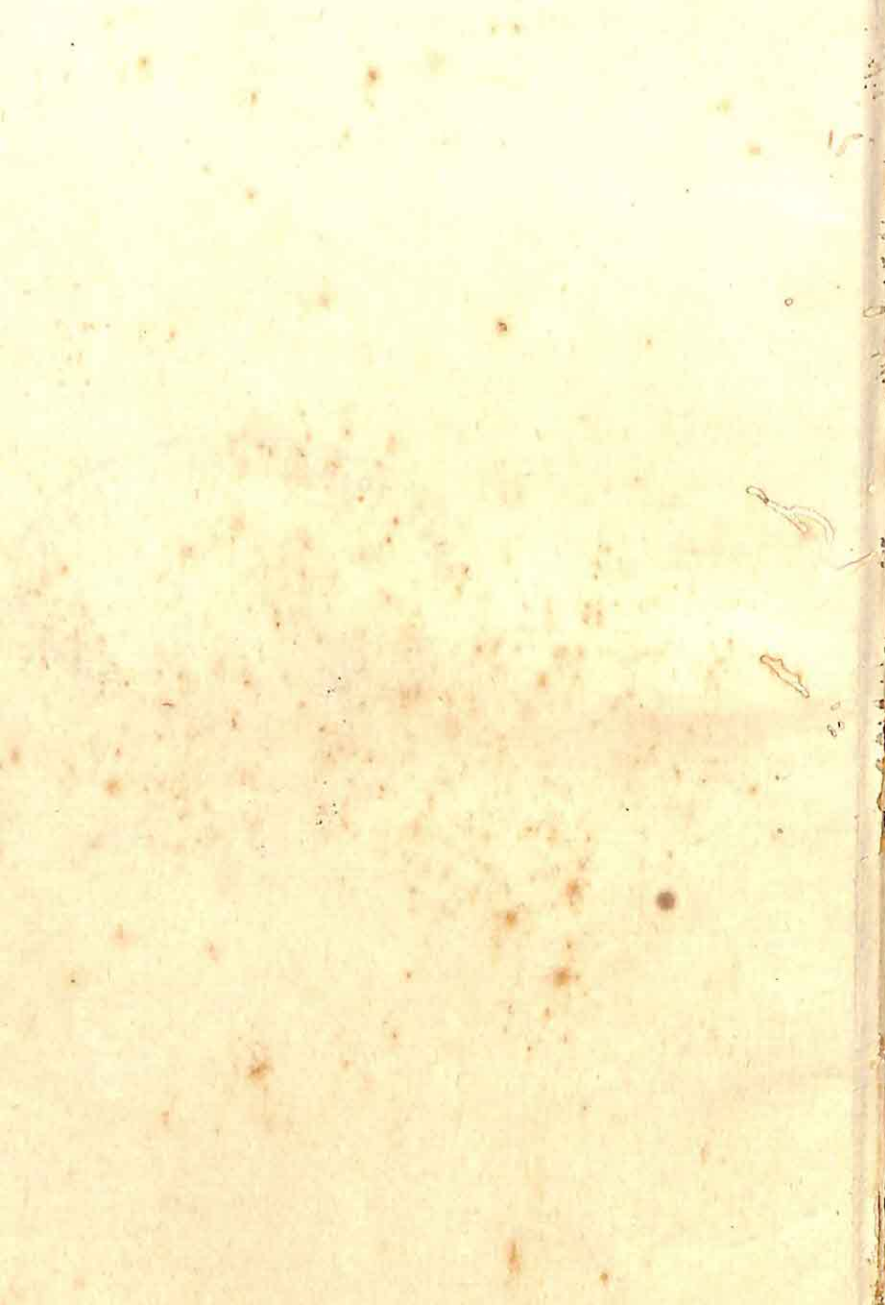
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GROUNDWORK OF
EDUCATIONAL PSYCHOLOGY





GROUNDWORK OF EDUCATIONAL PSYCHOLOGY

BY

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PRINCIPAL OF WESTMINSTER TRAINING COLLEGE

NEW EDITION



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PREFACE

IN writing this book I have endeavoured primarily to provide an orderly exposition of fundamental principle in psychology which would be suitable to the needs of my own students; but I have ventured to hope that others engaged in or preparing for the profession of teaching may find it helpful in some degree. For a considerable number of years I have sought to give students of education a workable knowledge of human nature on which to base their craft, and I have found that the doctrine most useful to them and to myself is that based on the teaching of Sir John Adams, Sir T. Percy Nunn, Dr William McDougall, and Dr James Drever. Thus the experienced reader will find no new matter in these pages, but rather the reaction to familiar doctrines of one whose main business is to teach as much of the subject as is possible in a one-year course of professional training. What I owe to the above-named original thinkers will be apparent on every page of the book, and I wish to take this opportunity of sincerely and gratefully acknowledging my indebtedness. In particular, I should like to thank those leaders of educational thought at whose feet I have had the good fortune to sit, and whose inspiration is responsible for any success that may have attended my own teaching—Sir John Adams and Sir T. Percy Nunn, of the University of London, and Dr Robert R. Rusk, of Jordanhill College, Glasgow, who was the first to guide my professional footsteps. I have also to thank my sister, Miss Helen S. Ross, M.A., of Hutchesons' Grammar School, Glasgow, and my friend and former colleague, Mr Herbert E. Winn, M.A., of London University, for their patience and kindness in reading and criticizing my manuscript; and Mr F. H. Pritchard, of Messrs George G. Harrap and Co., Ltd., for his kindly encouragement during the preparation of the work. Finally, and perhaps most of all, I must thank my students, past and

present, whose keenness and interest have provided a constant stimulus and have made every effort worth while. It is with sincere gratitude and affection that I dedicate this book to the men of Westminster College, hoping that they may find it of service in their labours.

J. S. R.

WESTMINSTER TRAINING COLLEGE
February 1931

NOTE TO THE NEW EDITION

THE favourable reception which has been given to this book seems to indicate that it largely fulfils its purpose of usefulness and to justify its continuance. Since it was first published an important work by McDougall has appeared. *The Energies of Men* (Methuen, 1932) contains a restatement of the 'instinct' doctrine designed to meet certain criticisms and misunderstandings with which its author has had to contend. It has not seemed necessary at present to rewrite large sections of the present work in order to use the revised terminology; but since the argument is to a great extent founded on McDougall's teaching it has been thought expedient to add at the end of the book a note dealing with the matter. Chapter IV and all other passages referring to instinct should be read in the light of this note.

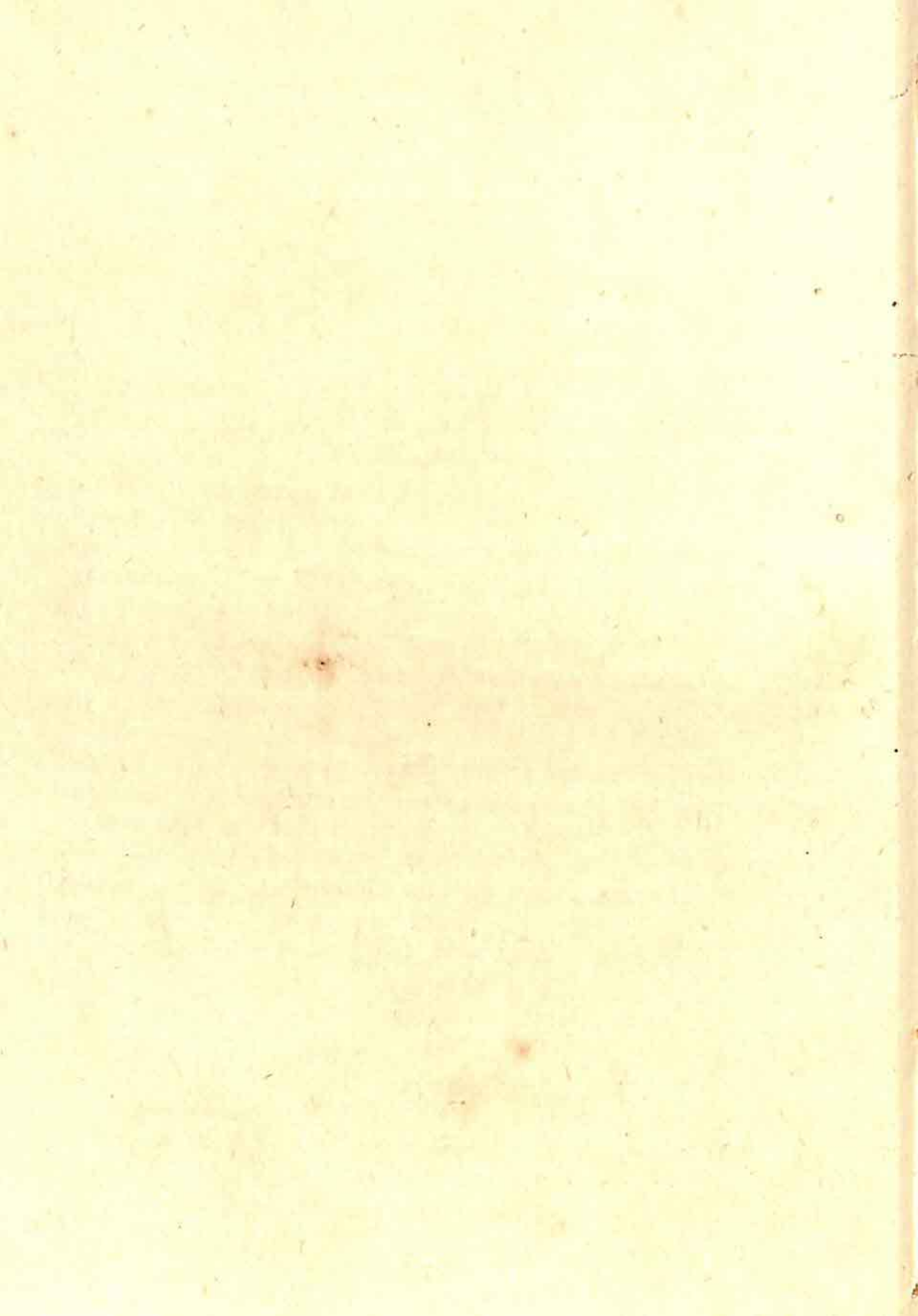
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CONTENTS

CHAPTER	PAGE
I. PSYCHOLOGY AND EDUCATION	9
II. FUNDAMENTAL HYPOTHESES	21
III. THE POWERS OF THE MIND	43
IV. INSTINCT AND EMOTION	55
V. HEREDITY AND EVOLUTION	76
VI. BROAD FEATURES OF HUMAN BEHAVIOUR	<u>96</u>
VII. PRODUCTS OF DEVELOPMENT	118
VIII. STAGES OF DEVELOPMENT	139
IX. MENTAL CONFLICT	155
X. ATTENTION AND INTEREST	169
XI. MEMORY	184
XII. THINKING AND REASONING	196
XIII. THE MEASUREMENT OF THE MIND	219
XIV. THE TYPE IN EDUCATION	241
XV. THE PSYCHOLOGY OF THE GROUP	248
INDEX	267



GROUNDWORK OF EDUCATIONAL PSYCHOLOGY

CHAPTER I

PSYCHOLOGY AND EDUCATION

A CENTURY has elapsed since the death of one of the greatest of educational pioneers, the Swiss schoolmaster Pestalozzi, whose avowed aim was to psychologize education and instruction. Perhaps it is not extravagant to think that, if he were to return to earth now, he would be satisfied with the progress that has been made in this direction; for educational psychologists since his day have been engaged in travelling, with an ever-accelerating pace, the road that he indicated, and have advanced considerably along its way. It is doubtless true to say that, before Pestalozzi, there were a few enlightened thinkers who had dimly recognized the need to psychologize education: one thinks, for example, of the Roman educator Quintilian, who considered to some extent the natural endowment of his pupils in his efforts to train orators; and of Thomas Fuller, who, in his *Holy State and Profane State*, gives as an essential quality of the good schoolmaster that "he studieth his Scholars' natures as carefully as they their books." But Pestalozzi was the first to emphasize the fact that the mind of the pupil is the primary concern of the educator, and that the art of education must be based on an accurate knowledge of mental processes. All this seems very obvious nowadays; but, as the day is not long past when a scholarly knowledge of a subject was supposed to be adequate equipment for the work of teaching, it is perhaps not altogether superfluous to reiterate that the teacher must know his pupil as well as his subject. Sir John Adams in his usual striking fashion has clinched the matter by quoting from his Latin Grammar: "Verbs of teaching govern two accusatives, one of the person, another of the thing; as,

Magister Johannem Latinam docuit—"The master taught John Latin." Throughout his long career this distinguished educationist of our own day has insisted that the teacher must know both Latin and John in order to teach them; and that, since the knowledge of John is psychology, the teacher must study psychology.

Before going further, however, we must consider what manner of psychology the teacher must study. Many an enthusiastic teacher, impressed by the need of having an accurate knowledge of mental processes, has procured learned works on psychology, read them diligently, and suffered much disappointment at their want of relevancy to the art of education. Such teachers are apt, as practical people, to conclude that the psychological basis of education is a myth, and one has a certain sympathy with them when they advise beginners in the profession to get down to teaching, and to forget all the psychology they have learned in training colleges, where deduced authorities consider it a subject of paramount importance. But a little inquiry into the definition and scope of the subject ought to explain the divergence between their views and those of Pestalozzi. Psychology literally means 'the science of the soul,' but this definition suffers from extreme vagueness, as we cannot give any satisfactory answer to the question, "What is the soul?" We are not on much surer ground when we define psychology as the study of mind, for here again we raise a multitude of unanswerable questions as to the nature of mind and its distinction from matter. The humorist who to the question "What is mind?" replied "No matter," and to the question "What is matter?" "Never mind," really crystallized these tremendous problems and our ignorance of their solutions. And yet, as we shall see, in order to get a psychology at all, we must make some bold postulates about mind. The psychologist of the generation before ours, realizing that he must free his inquiries from nebulous metaphysical speculations, and asking himself what, in the realm of mind, he could be sure of, came to the conclusion that the one certain thing was that he himself did think, feel, desire, and will; in other words, that he himself had certain states of

consciousness, or modes of experience, which could be examined by the process of looking within his own mind, or, to use the technical word, by introspection. But the introspective psychologists themselves recognized that their work was of little value for education. Professor James told teachers that it was only the fundamental conceptions of psychology which were of real value to them; ¹ while Stout cautiously, if a little more hopefully, said: "The main principle which psychology lends to the theory of education, as its starting-point, is the need that all communication of new knowledge should be a development of previous knowledge." ²

Was Pestalozzi, then, under a delusion in his hope for a psychology of education? Certainly the psychology we have been considering is of little value in education, for what we obviously require is a psychology not of the intellectual adult, but of the impulsive child. Can this be obtained from the introspective psychology of the adult? Perhaps we might look on the mental processes of the adult as those of the child "writ large," and expect to obtain a child psychology by reducing the scale of an adult psychology. A little thought, however, will show that this view is not altogether sound, for it implies the belief that a boy is accurately described as a little man. That this belief was current in Victorian days is indicated by a number of considerations. When we look at the portraits of our grandparents in their childhood we are amused to find that their dresses were those of adults *in parvo*; we are told, too, that their manners and morals had to conform to a high standard of adult excellence, and that the hard theological dogmas of the Shorter Catechism were considered suitable nurture for their immortal souls. The same view of childhood is apparent in much Victorian literature; the *Oliver Twists* and *Little Dorrits* of Dickens, for example, were endowed with a capacity for moral reflection and sober judgment that we do not seem to find in the frivolous children of our own day. George Eliot shows more insight in providing us with a Maggie Tulliver who was a real child, in open rebellion against the impossible

¹ *Talks to Teachers on Psychology*, p. 7.

² *Analytic Psychology*, vol. ii, pp. 137-138.

standards to which her horrid maternal aunts expected her to conform; but we have to wait till the twentieth century to get the delightful hero of *The Little White Bird*, whose fantasy of Peter Pan bids fair to make his creator immortal. To say that a boy is a little man is only slightly more accurate than to say that a tadpole is a little frog or that a grub is a little butterfly. A tadpole is obviously not a small model of a frog, but a frog in the making; and it is important to realize that a boy, too, is a man in the making, not a small model of a man.¹

These considerations give us a clue to the attitude of many excellent practical teachers toward psychology. Until recent years the bulk of the psychology available for those who sought a basis of fundamental principle for their craft was an introspective study written by intellectual adult philosophers, which, when it was boiled down to suit the case of the child, gave results that were wide of the mark. Such teachers, agreeing that their success depended on their knowledge of John as well as of arithmetic, rightly decided that their own experience formed a surer basis than the doctrines of the text-books. But every teacher who knows his pupil is really a psychologist in so far as his knowledge is accurate and applicable to other pupils; indeed, all who successfully deal with their fellows may reasonably be called psychologists. The astute auctioneer who skilfully plays on the acquisitive tendencies of bargain-hunters, the persuasive salesman who bows out a customer with a contented mind and an empty pocket, the demagogue who swears that black is white and gets his audience to believe him, and the preacher who moves his congregation to high endeavour are all practising psychologists in a very real, if not in a technical, sense of the word. The teacher who agrees that his effectiveness depends on his knowledge of child-nature will readily go further, admitting that the experience of others may be valuable to him and that he can learn much by comparing notes with other workers in the educational field. When teachers pool their knowledge of children, putting all their experiences into the common stock, we have the basis of a reliable child-psychology, for we are at the natural history stage which is

¹ See Adams, *Primer on Teaching*, p. 8.

essential in the development of any science. The child-study movement attempted something like this, getting its data from parents, teachers, and others who had to work with children. It succeeded in collecting an amount of valuable information and in formulating a number of generalizations, but its permanent value was less than might have been expected, owing to the fact that the observers lacked scientific training.

The desire of Pestalozzi, then, cannot be realized by re-editing the introspective psychology; nor would it seem that the long-sought scientific basis of education can be provided by the busy practical teachers themselves. With the advent of the twentieth century, however, there has come into being an ever-growing body of psychological knowledge which gives every promise of providing a background of fundamental principle in education. The psychologist of to-day is taking a less philosophical, more practical view of his subject, and a sure, if gradual, reorientation has taken place. Having asked himself the straight question, "What is the real object of my inquiries?" he has come to the conclusion that his ultimate task is not primarily to sift and analyse his own conscious states into a set of abstractions which have little relation to actual life, but rather to explain the behaviour of living beings. We see, if we think for a moment, that a man's study of conscious states must be confined to the examination of his own experience, while his study of behaviour can include in its scope any living being that behaves. I cannot study your conscious states directly, nor can you study mine; but either of us may study the behaviour of the other. To take a concrete example, if you are angry I cannot study your anger. I see you with a glare in your eyes, a flushed face, and clenched fists, and I do not need much psychology to be quite certain that you are angry; but what I really study at first hand is not your anger, but your angry behaviour. What are the grounds of my inference that you are angry when I see you behave like that? The grounds are simply that I believe you to be a being like myself; I know that when I am angry I behave or tend to behave in that way; and when I see you behave in that way I conclude that you are angry. It is clear, then, that in order

to get a useful psychology of the human being the psychologist must get beyond the examination of his own experience, and study behaviour, seeking to interpret it by analogy with his own behaviour in relation to his own mental states. Thus psychology is the interpretation and explanation of behaviour in mental or psychical terms: as Dr James Drever says, "We must define it as the science which seeks to interpret in psychical or mental terms the behaviour of living organisms, so far as that is psychically conditioned."¹ It will be noted that here we still have the fundamental hypothesis of a mind behind behaviour and controlling it. For this no apology is made; the most reliable evidence that mind exists is found by looking within and observing our own states of consciousness. It should be realized, however, that there is an ultra-modern school, the 'behaviourists,' who seek to explain behaviour without having recourse to anything in the nature of a mental hypothesis, believing as they do that the laws of chemistry and physics will prove adequate. Their views find little support in Britain, and the result of their endeavours, in the opinion of those competent to judge, is not psychology, whatever else it is.

It is this new psychology of behaviour, then, that is of great importance to the educator. For, whatever divergence of views there may be with regard to the aim of education, all educators agree that, with a definite end in view, they seek to modify behaviour and that which conditions it. If psychology as the study and explanation of behaviour cannot help in this task it is indeed useless. But it is not useless: Pestalozzi was right, and his far-sighted aim is being realized in our own day. The teacher, concerned as he is with the modification of behaviour, is finding invaluable help in the newer psychology. Educational theory and psychology have been and are advancing hand in hand. Not only does the teacher turn to psychology for help in his practical difficulties, but he in his turn dictates new problems to the psychologist, and so helps to advance the science. In his presidential address to the Educational Science Section of the British Association in 1912 Sir John Adams said that education had captured psychology.

¹ *An Introduction to the Psychology of Education*, p. 11.

Perhaps this is an overstatement, unless we are willing to stretch the meaning of the word education so far beyond its usual scope that it become synonymous with life itself. But it is true to say that much of present-day psychological research is being undertaken in the interests of education, and that there is no place more useful than the school for testing the applicability of psychological theories to life.

Psychology, then, occupies a prominent place in the educational theory of to-day, and it is not easy to overemphasize the contribution it has to make. At the same time one must beware of pressing its claims too far, for there are many questions in education which it is powerless to decide. These questions concern the aim of education. Now psychology is not concerned with aims; it is a positive, not a normative science; that is to say, it deals with facts as they are, not as they ought to be. The psychologist, as a psychologist, merely studies behaviour, not seeking to influence it or improve it; his business is not to assess the moral worth of behaviour, and for him its most reprehensible forms are just as interesting and important as its loftiest manifestations. Indeed, the impression one is apt to gather from many modern books on the subject is that the former are much more interesting and important. Education, however, is very much concerned with aims, ideals, standards, and values, and these in themselves are beyond the province of pure psychology. It is philosophy, not psychology, that tells the educator what he ought to do. Thus education cannot be described as applied psychology, nor ought the school to be regarded as a mere psychological laboratory.

Although psychology cannot formulate the aim of education, a reliable psychology will tell us at once whether an aim is hopelessly in the clouds or whether it is possible of achievement. A foolish educator might formulate the aim of annihilating the instinct of self-assertion in his pupil, but psychology would tell him that he was attempting the impossible, for instincts, even if undesirable, cannot be dealt with in this summary fashion. Sir T. Percy Nunn, in his masterly defence of the proposition that the aim of education is to foster individuality, is much concerned, after stating his aim, to show

that it is psychologically possible, and he enlists powerful psychological arguments to prove that it is the only education 'according to nature.' In recent years Dr James Drever has argued that the bearing of psychology on the aim of education does not end with its deciding whether it is possible or impossible.¹ He points out that without the aid of psychology the educator cannot know whether he has succeeded in his aim or not. It is an apparent truism to say that before an educator can be satisfied with his results he must know what these results actually are, but here there is a real difficulty. Certainly the educator can know from careful observation whether or not he has modified behaviour as he wished, but no educator is satisfied with merely modifying behaviour. Any educator worthy of the name seeks to modify the inner springs of conduct which control that behaviour, for it is clearly possible to have behaviour conforming to a code while the motives behind it are far from satisfactory. These motives are not easily discovered; and, in order to interpret the modified behaviour of his pupil and discover whether the motives underlying it are worthy, the educator must once more seek the aid of psychology. Without its help he cannot know whether he has succeeded in influencing character as well as conduct.

We have seen, then, that, although psychology cannot decide the aim of education, it can tell us how far that aim is practicable and help us to evaluate our results. But it is in the process of achieving his aim that the educator finds psychology of the utmost value. If the end of education is beyond the province of psychology, the means are one of its most important applications. An educator with an aim of education that is possible must turn to psychology in order to discover how it is to be realized with a minimum of trial and error. Psychology does not give us a philosophy of education, but it is providing the materials for a science of education. Now Adams² tells us that the means of education are twofold: (a) the direct application of the educator's personality to the personality of the educand, and (b) the use of knowledge in its various forms.

¹ *An Introduction to the Psychology of Education*, chapter i.

² *The Evolution of Educational Theory*, chapter i.

The actual or prospective teacher, then, will expect psychology, in the first place, to shed light on the nature of those two persons in the bipolar process of education, himself and the educand. He will rightly hope that, since his task is to influence others, his study of psychology will enable him to understand himself. He will also expect it to tell him of the innate endowment of the child, of the laws of his development, of the ever-growing complexity of his mind, of the effect of environment, and, above all, of the formation of character. He will not be totally disappointed in these hopes if he turns to the pages of McDougall, Nunn, and many others, including the exponents of the psycho-analytic schools. In the second place, the teacher will expect to learn from psychology how one personality acts on another, how the influence of group-life modifies the individual, how the corporate life of a school assists in the development of a child. In seeking information on these points he will find a certain amount of recent literature on group psychology awaiting his attention. In the third place, he will certainly expect to find guidance in the ancient craft of teaching; he will wish to know whether psychology can tell him how knowledge systems are built up, how new knowledge is received into the mind, how we think, and how we reason. For nearly a century the teacher has had the eminently workable psychology of Herbart available for this purpose, and it has now been supplemented in many valuable directions by later writers who are not ashamed to acknowledge their debt to this great pioneer.

How is the student of education to get his knowledge of psychology? In asking this question we are led to examine briefly the main methods of psychological study. As in all sciences, the data are got by the comprehensive methods of observation and experiment, the distinction between the two being that in experiment we control the conditions, while in observation we do not. The traditional method of observation employed in psychology is, as we have seen, introspection. This method is always associated with the name of Locke, the founder of British psychology, who defined it as "the notice which the mind takes of its own operations." Introspection as

a method would at first sight appear to have certain advantages: the psychologist's own mind is his laboratory, and, since it is always with him, he can make observations whenever he feels inclined; no expensive material or apparatus is required, for these also are his own mind. But there are many disadvantages. The observer and the observed are the same, for the mind is both the field and the instrument of observation. Again, in physical science it is usually an advantage to have an abundance of material, but in introspection it is unfortunately true that the more material there is to observe the less power there is to observe it. For example, I may be furiously angry, or I may be concentrating on a mathematical problem, and so have abundance of material to make psychological observations on the emotion of anger or on the reasoning process; but whenever I try to do so I become less angry, or concentrate less, and my material flies from me. Reflection on a mental state inevitably changes the character of that state; thus I can never be sure that the data I get by introspection are even remotely akin to the mental state I set out to examine. James put this difficulty in a picturesque way when he said that "the attempt at introspective analysis is . . . like trying to turn up the gas quickly enough to see how the darkness looks."¹ The only way in which we can overcome the difficulty is by the aid of memory; by remembering we can recover the original state. Again, introspection can yield us little information about the minds of savages, children, and mental defectives, and yet knowledge of these undeveloped minds is of vast importance, especially in a psychology of education. Introspection suffers also from the defect of subjectivity; an observation or experiment is said to be subjective when its results depend on the observer, and are not verifiable by other observers. This is certainly true of introspection, and psychologists, seeking to remedy this defect, have sought objective methods, where the same result is obtained whoever performs the investigation. These methods are to be found mainly in the realms of experimental psychology, where masses of valuable quantitative results have been collected regarding the various

¹ *The Principles of Psychology*, vol. i, p. 244.

powers of the mind. Again, the application of mathematics to results obtained from large numbers of subjects has decided in many cases which of two conflicting theories is true, and such methods may fairly be called objective. Observation of behaviour, too, seems capable of being made objective: the results of two equally competent observers should agree; but their interpretation in psychical or mental terms, which must be attempted if the result is to be psychology, ultimately depends on introspection. In experimental psychology, too, the introspection of the subject is usually considered very important. The truth is that, with all its defects, introspection is an indispensable method in psychology, for the interpretation of behaviour in terms of mind must, in the last resort, involve the psychologist's own introspection.

It is now realized, however, that those aspects of our mental life that are open to introspection are inadequate to explain behaviour. In seeking a complete explanation psychologists have been compelled to formulate various hypotheses about the mind, notably the 'unconscious' of the psycho-analysts and the 'mental structure' of the McDougall school; and these, by their very nature, are not discoverable by introspection.

Probably the best way for the student of education to obtain his psychological equipment is to read widely and critically in the various branches of psychology. But he must ever seek to make his knowledge real and practical by observing his own behaviour and mental processes, and by trying to remember the thoughts, feelings, and actions of his own childhood. He will do well to observe carefully the behaviour of animals and children, especially of individual children, interpreting it by means of his knowledge gained from books, and thereby testing that knowledge. He should acquaint himself with the methods of experimental psychology, and by means of these methods try to solve experimentally some of his own classroom problems. But the teacher, with the best will in the world, cannot be a full-time psychologist. He must, in the main, accept the results of more expert investigators, reserving the right to be critical of them and to pass them by if they do

not help to solve the problems with which he, as a practical teacher, is every day confronted. The following chapters seek to provide him with a groundwork of psychological principle which will assist him in his labours.

SUGGESTIONS FOR FURTHER READING

ADAMS : *Herbartian Psychology Primer on Teaching*.

RUSK : *Experimental Education*, chapter i.

WELTON : *The Psychology of Education*, chapter i.

DREVER : *Introduction to the Psychology of Education*, chapter i.

MCDUGALL : *An Outline of Psychology*, chapter i ; *An Introduction to Social Psychology* (17th edition), chapter i.

SANDIFORD : *Educational Psychology*, Introduction.

STOUT : *A Manual of Psychology*, chapter i ; *The Groundwork of Psychology*, chapter ii.

HÖFFDING : *Outlines of Psychology*, chapter i.

CHAPTER II

FUNDAMENTAL HYPOTHESES

IN the previous chapter it was maintained that the task of the psychologist is to study behaviour in so far as it is psychically conditioned, and to interpret it in psychical or mental terms. The inquiring student, however, cannot be content to proceed until he has clearer ideas of what is meant by 'behaviour' and 'psychical.' In the present chapter an attempt is made to discuss these fundamental notions and to state frankly what is assumed about them.

The first stage in the evolution of any science is the observation of facts and the accumulation of data; while the second is the classification of facts, or, as Huxley familiarly put it, the tying up of similar facts into bundles. But a further step is necessary in the scientific treatment of a body of facts—namely, that of explanation. Now, in all branches of knowledge the would-be scientist seeks his explanation by the same general method. He reflects carefully on his classified results, and achieves—sometimes by patient labour, sometimes by a brilliant guess—a hypothesis or provisional theory which seems likely to explain them. He then tests his hypothesis by applying it to his collected data. If he can readily bring all his facts under it; if he can fit new facts, as they are discovered, into their places; if, finally, he can make deductions from it which prove to be facts, then his faith in the validity of his hypothesis is strengthened and he believes it to be the true theory. But it cannot be too clearly understood that an hypothesis is merely a provisional theory which, however attractive, must be discarded if there are certain facts which it will not explain, or if observation and experiment fail to verify it.

A familiar example ought to make clear the provisional nature of a hypothesis. The ancients, with ever-increasing accuracy, surveyed the motions of the heavenly bodies, and

eventually framed a famous hypothesis to explain what they had observed. Ptolemy in his *Almagest* put forward the theory that the earth was fixed, and that all the heavenly bodies moved round it. This simple hypothesis seemed at first to fit the facts; but, in order to serve as an explanation for others—for example, the motion of the planets—it had to be modified and elaborated in several important respects. It is worth remembering that the Ptolemaic hypothesis held the field for fourteen centuries, and that by means of it exact prediction of astronomical events was possible. But eventually astronomers, in their efforts to fit new facts into this theory, had to elaborate it to the point of unwieldiness. Copernicus then came forward with an alternative hypothesis—that the sun and the stars are fixed, that the planets move round the sun, that the earth spins on its axis, and that the moon moves round the earth. This revolutionary hypothesis was simpler than its predecessor; it fitted the facts better, and so the older Ptolemaic hypothesis was gradually discarded in its favour. New discoveries fitted into it more easily, and we now believe it to be true, although it too has been subject to elaboration and modification.

It is highly necessary to bear these considerations in mind in the study of psychology, for many of the notions and terms that are used so glibly are merely hypotheses—provisional theories—which partially explain the facts of behaviour and give a more or less coherent account of it. Thus it must not be imagined that the psychological theory found here or elsewhere is given dogmatically as a statement of absolute and proven fact; as knowledge increases it will be necessary to discard some theories and to modify others. McDougall's warning is salutary in this connexion.

In making and using such hypotheses, it is all-important to be aware of what we are doing and to be ready to modify or abandon them at need. If we maintain this attitude, hypotheses are great aids to discovery, and, in so far as they are well designed, they greatly simplify description and facilitate explanation.¹

¹ *An Outline of Psychology*, p. 11.

What, then, are the hypotheses which will underlie our account of behaviour?

The first concerns the nature of behaviour itself. We make the great assumption that behaviour is a phenomenon fundamentally different in kind from the action of any machine, however complicated. Let us consider examples which will bring out the difference between the two. A golfer hits his ball off the tee: it may roll for a few yards; it may soar through the air in a beautiful parabola; it may, in an irritating fashion, curve to the right or to the left. But, however the golfer may blame the ball for its unsatisfactory movements, he knows in his heart that its whole motion is determined by the impact of the club, the force of gravity, the resistance of the air, and the wind that happens to be blowing at the moment. It is purely the sport of the forces that play on it from without, and it has no will or initiative of its own. In contrast, we may consider a bird picking up crumbs and a cat behind, stealthily engaged in stalking it. Suddenly the bird sees the cat and immediately flies off, fluttering hither and thither in great agitation until it finds itself in safety on the branch of a tree. Our assumption is that the motion of the golf-ball and that of the bird are fundamentally different things. The former is a simple type of mechanical motion, while the other, since it cannot be explained on mechanical principles, we call behaviour.

We may use the example to analyse a little further the difference between behaviour and mechanical action. In the first place, the bird's movement is spontaneous—that is to say, it is directed from within—while that of the ball comes from without. In the case of the ball outside circumstances are wholly responsible for its motion; but in the case of the bird the cat merely releases an activity that is subsequently pursued independently of it. Again, there is an important difference in the fact that with the same stimulus the bird may vary its movements, while in the case of the ball the same antecedents always produce the same results. Further, the bird ceases to move when a certain change in its situation has been brought about—that is, when it has reached a position of safety; but the ball ceases to move only when its kinetic energy has been spent

in overcoming resistance. (We may sum up by saying that the keynote of behaviour is purpose.) The ball moves with no purpose of its own, but the bird's movement has an end in view—that is to say, the attainment of safety. Behaviour, therefore, is

action that seems to be governed or directed in some degree by prevision of its effects, by prevision of that which still lies in the future, of events which have not yet happened, but which are likely to happen and to the happening of which the action itself may contribute.¹

We say that the motion of the ball is *caused* by the impact of the club and the other forces, and that it is the *effect* of these causes; but the categories of 'cause' and 'effect' seem inadequate to explain the flight of the bird. We should rather say that the bird's movement is its response to a stimulus; it is not caused altogether by the cat, but is directed toward an end, looking to the future. Behaviour, then, is purposive, or *teleological*, to use the word current in such discussions; the causal explanation must be supplemented by the final; ('in order that' must be added to 'because.')

There are thus, we believe, two great classes of things, those whose changes are explicable by mechanical, physical, or chemical principles, and those whose activity cannot be so explained, but is directed, however vaguely, toward an end. The second class exhibits behaviour; and *behaviour*, not mechanical action, is the subject-matter of psychology.

We may put this far-reaching assumption in another way by saying that behaviour is the activity of a living organism, while mechanical action is the movement of non-living matter. Thus the fundamental difference we have been discussing is the difference between the *living* and the *inert*. To say that part of our environment consists of living organisms and that the rest consists of dead matter savours of dogmatism, and one sympathizes with the student who wishes to have the difference more fully explained. But in the present state of our knowledge it is profitable for the psychologist to take life as an

¹ McDougall, *An Outline of Psychology*, p. 48.

ultimate notion which cannot be fully explained in terms of the laws that govern the physical world.

There are those, of course, who believe that a living organism is nothing more than a very cunningly devised physico-chemical machine. Much has been discovered concerning the wonderful way in which the bodies of living creatures obey physical and chemical laws; and the mechanists believe that, if our knowledge were complete, we should find that all the phenomena of behaviour could be explained in terms of physics and chemistry. It is their hope and ambition to synthesize a living organism in their laboratories. At present they would state, as an article of faith, that the action of the bird, in our example, differs only in degree of complexity from that of the ball; that the autonomy of the bird is only a delusion; that every time it acts as it does because it must. The science of behaviour, then, would become a branch of physical science; psychology and physiology would become identical.

The great philosopher Descartes saw no reason for assuming that an animal is anything more than a machine of great complexity; but he would not regard man as a mere machine, since he could not ignore that inner experience which told him that he himself had a soul. Some of his followers, however, did not hesitate to apply the mechanist doctrine to man himself, and we have their successors with us to-day. But they have not proved their case; their belief is an hypothesis that has not been verified, and many nowadays seem inclined to abandon it. There is an ever-accumulating amount of evidence that the behaviour of even the most lowly organism cannot be explained on mechanical principles; that the simplest living thing is more than a machine; that its reactions are not entirely caused by antecedent circumstances; that it can vary its responses, and does so in a way that will further its own well-being and that of the race to which it belongs.

The hypothesis here laid down amounts to saying that the mechanists are wrong in their main assumption. Rather must the psychologist accept the main tenet of the various vitalist schools, that (there is a fundamental difference between a machine and a living being.) We can express this difference

most generally by using the word 'life'; but we must seek to analyse its meaning a little further, if possible.

In the first place, the living being is an organism; that is to say, it works as a unity, and the whole is more than the sum of the parts. Each part behaves as if it knew what all the other parts were doing. Let us suppose, for a moment, that the chemist in his laboratory has succeeded in synthesizing a living cell; let us further suppose that a super-physiologist attempts to construct out of these living cells an animal of some degree of complexity. It baffles the imagination to conceive how he could organize these cells so that certain of them would specialize in one function, others in another. Yet this organization and specialization of function are found very low in the scale of living things. An animal is an accumulation of living cells, but it is something more. Using the phrase of Sir T. Percy Nunn, we may say that, at all its levels, the living creature exhibits "unity in diversity." Although it may be analysed, a subsequent synthesis of the products of analysis would lack the essential element, this mysterious organization, or "unity in diversity."

In the second place, the living organism is autonomous; it is self-governed and directed from within, thus being free to vary its responses. This does not mean that it can escape from the laws of its own nature; but it does mean that it can obey these laws in a variety of ways, in much the same fashion as a player of a game may scrupulously observe the rules and yet show his initiative in choosing how he will obey them. It is in this sense that a living organism is a self-directed agent.

Other outstanding characteristics of the living organism are its power of growth by the assimilation of food and its power of reproducing its own species. It also possesses what has been called the power of self-maintenance; the organism has a certain stable bodily form which it seeks to preserve. Many of the lower animals when injured regenerate their lost parts and recover their normal form in the most wonderful way. Although man cannot grow again a lost limb, he has by no means entirely lost this power of self-maintenance, which is manifest in the healing of wounds and the recovery from disease.

Professor G. T. W. Patrick sums up many of these points when he says tersely :

Life is self-adjusting, self-maintaining, self-preserving, and self-perpetuating. There is nothing like this in the mechanical world. Machines do not adjust, maintain, preserve, or perpetuate themselves.¹

Yet another way of stating the fundamental hypothesis, that behaviour differs from mechanical action and that the living organism is not a machine, is to say that mind exists. Now, if we attempt to define mind we are confronted with the same difficulty as was encountered when we were considering the nature of life. We may say quite frankly that it is impossible to define mind in any satisfactory way. Although McDougall has said,² "We may fairly define a mind as an organized system of mental or purposive forces," he is well aware that the words 'purposive' and 'forces' are a begging of the question. When we use the word 'mind' we once more return to those fundamental distinctions which we have been discussing. Mind is an ultimate notion, and it is the possession of at least a rudimentary mind that differentiates the living organism from the machine. If we refuse the faith of the mechanists we have no alternative to a mental hypothesis; that is, a hypothesis which involves mind or some equivalent notion. We must look on the mind as the something which lies behind behaviour and controls it, making it behaviour rather than mechanical action; as the something which a living organism has and a machine has not.

One might be tempted at this point to plunge into a metaphysical discussion of mind, for such discussions are fascinating even if, like old Omar Khayyám, we come out at that same door as in we went. Usually the mind is contrasted with matter in general, and with the body in particular. In popular thought it is conceived of as inhabiting and controlling its tenement of clay; and the intimate connexion between the mind and the brain is familiar to all. But the nature of this

¹ *The World and its Meaning*, p. 81.

² *Psychology* (Home University Library), p. 229.

connexion—the psycho-physical problem—is an insoluble mystery. Philosophers have put forward various theories, all fascinating, but none capable of proof. There are those who believe that mind and matter are two different ultimate realities; they are therefore labelled dualists. Some of them are content to state that the mind and the brain work in parallel grooves, and put forward what is known as the doctrine of psycho-physical parallelism; but this amounts to little more than a statement of the problem. Other dualists, in spite of difficulties, stoutly maintain that the two interact with one another in an intricate way, that the one sphere of reality is continually intersecting the other; and this theory of interaction is defended to-day by certain philosophers whose opinions must be listened to with respect.

On the other hand, there are those who postulate only one ultimate reality and are therefore called monists. They put forward what is known as the identity hypothesis, stating that, in the last resort, mind and matter must be identical. Of course, the monists differ widely among themselves, some believing that the ultimate reality is mental, others that it is material, and others that it is something beyond both mind and matter as we know them. An interesting modern development in connexion with this problem is the present tendency in physics to discard the notion of matter, and to express everything in terms of symbols, offering no opinion as to what the symbols stand for. Some seem to believe that the reality behind the symbols of physical science may be the very stuff of our consciousness. A fruitful notion is to talk not of body and mind, but of the body-mind or the mind-body. This emphasizes the fact that our concern is with the organism as we find it, and not exclusively with either its mental or its material aspect. Body and mind may well be mere entities created by our thought—that is to say, hypostatizations, having no existence independently of one another. All such speculations as to the nature of body and mind and their connexion with one another are of profound interest and importance to the student of philosophy, but the educational psychologist may, with a good conscience, leave them to his leisure moments.

The important point is that, in one form or another, we must put forward and accept a mental hypothesis; for it seems quite certain that, by doing so, we are more likely to give a coherent account of behaviour than the behaviourist who refuses such an hypothesis, who ignores everything mental, and whose fragmentary account of behaviour is merely a branch of physiology.

Thus, to say that psychology is the science of behaviour is no real escape from the difficult notion of mind, for the only intelligible and convincing account of behaviour that can be given must be in terms of mind, life, and purpose. So the traditional definition of psychology as the science of mind, although temporarily discarded for the sake of clearness and objectivity, is the true one. Mind is the central notion of psychology, while behaviour is merely its subject of study. Psychology has never escaped from mind, and it never will. At one time it called itself "the description and explanation of the phenomena of consciousness," but these are mental in nature; now it calls itself the science of behaviour, and its case in this respect is no better. It is clear, therefore, that, although we cannot define mind in terms of anything simpler, we must assume its existence, and endeavour, as we go along, to make the details of our assumption clearer.

The mind, then, of the individual organism is that which expresses itself in his experiences and in his behaviour; and we have to build up our description of the human mind by gathering all possible facts of human experience and behaviour, and by inferring from these the nature and structure of the mind.¹

There are, however, two main aspects of our mental hypothesis which will be with us constantly throughout our study, and therefore call for preliminary discussion here. These are consciousness, experience, or the functioning of the mind on the one hand, and the unconscious, the dispositions, or the structure of the mind on the other. If our knowledge were complete, and a logical treatment possible, we might begin by discussing mental structure, but, since it is of the

¹ McDougall, *An Outline of Psychology*, p. 35.

functioning of the mind that we have first-hand knowledge, we probably do well to put experience first.

When we ask what is meant by experience we find once more that we are dealing with something indefinable. And yet, for me, my own experience is the most certain thing in the world. I am quite certain that I know, feel, desire, and will, that I hear and that I see; and this knowing, feeling, desiring, and willing, this hearing and seeing, along with many other mental states, constitute my experience. My experience is a something that is going on, a mental process or activity within me, of which I, and I alone, have first-hand knowledge. Here, once more, we are back at our fundamental hypothesis of life; here again we have a way of expressing the mysterious something that differentiates a living organism from a machine; for experience

is a term that has no application outside the circle of sentient beings. It is confined to the biological world, meaning that an organism, an animal, or a man feels something and does something. We do not say that a stone rolling down the mountain and colliding with a tree has had an experience.¹

There are certain essential points about experience that must be made clear. The first is that experience implies a person experiencing; that is to say, it must have a subject. A little consideration should make this clear. There can be no experience of pain, for example, apart from some one who is experiencing that pain. The pain is a state of the subject; it has no independent existence, and it ceases to exist when it ceases to be experienced. It is necessary to realize this clearly, since much nonsense is talked about unconscious experiences, experiences stored in the unconscious, experiences existing when they have been forgotten by the subject, and so on. Such talk, implying as it does that experiences have independent existence of their own, can lead to nothing but confusion of thought, and it is hoped that it will be possible to exclude it altogether from these pages. Experience, we must

¹ Patrick, *The World and its Meaning*, p. 383.

reaffirm, is a process, an activity of some subject.¹ This 'subject' must be one of our hypotheses, the nature of which is a difficult question of philosophy that need not detain us here.

In the second place, all experience is the experiencing of something; that is to say, there is always an object of experience. If I have an experience of the particular quality that I call toothache, the toothache is the object of my experience, or the psychical object, as Stout calls it. I do not say, "I experience a decayed tooth," but "I experience toothache": thus it is 'toothache,' not the tooth, that is the object of the experience. No doubt the decayed tooth gives rise to the toothache, and we may get rid of the disagreeable experience by having the tooth removed. But the tooth, we assume, has existence outside our minds; we do not experience it, but only the psychical objects to which it may give rise.

The third point that requires emphasis is the tremendous importance of experience. Descartes, in a famous phrase, said, "*Cogito, ergo sum*," which might be paraphrased "I experience, therefore I exist." My experience is for me the most fundamental of all facts. Philosophers may convince me that, in the last resort, I cannot prove the existence of an external world behind my experience, but they can never convince me that my experiences themselves do not exist. When I am dealing with an orange I am quite certain that I experience yellowness, roundness, roughness, a taste of a certain quality, and so on; and I believe, although I cannot prove, that there is something outside me which gives rise to these experiences. But if that something exists independently of my mind it is again certain that I can know it only through my experience of the psychical objects occasioned by it. All my knowledge of the external world comes through my experience.

It is particularly important in the study of psychology to remember that we are dependent on our own experience for all our knowledge of behaviour. Obviously I cannot know anything about the behaviour of another unless I observe it; that

¹ Stout uses the term 'subjective process' as equivalent to 'experience.' See his *Groundwork of Psychology*.

is, unless it is for me an item of experience; but further, as we saw in the previous chapter, I cannot understand or interpret it except in the light of my own experience.¹ Thus it is not only true to say that the psychologist's data are supplied through his own experience; it must be added that his own experience supplies the only possible clue to the interpretation and explanation of these data.

Lastly, since the question of terminology is one of the greatest difficulties in psychological study, we must inquire whether the word 'consciousness' is synonymous with the word 'experience.' It would certainly be convenient if the two words could be interchanged; but the trouble is that various writers assign different shades of meaning to 'consciousness,' many using it as equivalent to 'awareness.' Now we cannot agree that experience, as mental activity, necessarily implies the subject's awareness of that activity: we may have an experience without being aware of it. For example, I am studying intently, and stop, wondering what time it is, and I realize that Big Ben struck twelve some little time ago; I look at my watch and find that the time is ten minutes past twelve. What was my experience when Big Ben actually did strike twelve? I was unaware of the striking, for my mind was occupied with other matters; but I must clearly have had an auditory experience which was below the level of awareness. Should I, then, say that I was conscious of Big Ben striking? Only if the word 'conscious' has a wider meaning than the word 'aware.' Thus the terms 'consciousness' and 'experience' cannot be equivalent if awareness is considered essential to consciousness; and, since there is always some doubt about this, it is well, in order to avoid ambiguity, to use the word 'experience.' A little farther on we shall try to describe experience rather more objectively; that is, as Drever puts it, from the point of view of a hypothetical external observer capable of observing all the facts. Meantime we may note that we have some experiences of which we are intensely aware, some of which we are only dimly aware, and some of which we are unaware. The experience is one thing, and the apprehension of it or the awareness

¹ Pp. 13-14.

of it is another. This important point is crystallized by Professor Spearman in his first law of cognition: ¹

Any lived experience tends to evoke immediately a knowing of its direct attributes and its experienter; that is to say, it tends to be apprehended in both its objective and subjective aspects.

If the word 'consciousness' connotes 'awareness' we can call an experience which has been apprehended a conscious experience, and one which has not yet been apprehended a subconscious or unapprehended experience.² This would be in accord with much current usage, and it has the merit of distinguishing between the words 'subconscious' and 'unconscious,' the latter being reserved, as we shall see, for the structural side of the mind.

It is hardly necessary to urge the claim of experience to rank as a fundamental hypothesis of psychology, for it is the traditional subject-matter of study. The behaviourist position may be regarded as the extreme reaction from the psychology which was merely the study of individual experience. The introspective psychologists examined experience minutely, dividing and classifying it with the utmost care; and although we agree that psychology has done well to widen its scope, we should be foolish to ignore the main findings of the introspective school. Probably the most important of these conclusions is that there are three main types of experience, or modes of being conscious: we can know, we can feel, and we can desire, strive, or will. The three modes of experience are, then, 'cognition' or the knowing-experience, 'affect' or the feeling-experience, and 'conation' or the striving-experience. The recognition of these three ultimate types is by no means confined to the older school; psychologists come to this trinity of experience from the new standpoints as from the old, an agreement all the more striking when we consider the radical differences that are apparent in other matters. In this analysis of experience we do seem to stand on solid ground; by universal consent we have

¹ *The Nature of 'Intelligence' and the Principles of Cognition*, pp. 48, 342.

² The prefix 'sub' does not here mean 'under,' but 'slightly,' as in the word 'subacid.' No double-chamber theory of the mind is implied.

cognition, affect, and conation, ultimate modes of experience, irreducible to one another.¹ We cannot, for example, take feeling and describe it as a kind of knowing or a kind of striving, or as a combination of both.

We shall, then, accept the triple division of experience, and, as it will be with us throughout our study, we shall do well to understand it now. Let us consider an illustration. I am in a crowd, and, casting my eyes around, I recognize a friend; here I clearly have the kind of experience that is called knowing or cognition. I feel pleased to see my friend, and thus have an experience of affect or feeling. I strive to get near him and to attract his attention; now I have an experience of desiring and striving, or, to use the more inclusive word, an experience of conation. Now in this example the three modes of experience more or less succeed one another in time, but this is not necessarily so; frequently they are inextricably mixed. Moreover, it is important to realize that our experience is never one of pure cognition, affect, or conation. We never find the modes in their pure state; if we seek examples of undiluted cognition, affect, or conation, we always find the others lurking in the background. I might think that the understanding of a geometrical theorem is a state of pure cognition; but I do not understand it without having some lurking attitude of feeling toward it. I may be pleased at having mastered it, I may be displeased with its lack of interest, I may wonder at its mathematical beauty, I may be annoyed at having to spend my time on such things; it is at least certain that some such attitude will be there in however small a degree. Conation too is present. I may have had to strive to understand it, I may wish, like Archimedes, to tell the world of my wonderful discovery, I may try to dismiss it from my mind; but I shall have at least an incipient conation toward it. Thus my mental state is not purely, but only predominantly one of cognition.

Similarly, if I try to find a state of pure feeling I can detect the presence of cognition and conation. I may be beside

¹ Although Stout adopts a dual division of experience into cognition and interest, he finds it necessary to subdivide interest into feeling-attitude and conation.

myself with anger, but presumably I am angry at something, and I know what that something is; and certainly I cannot remain in a state of anger without desiring and willing to give some expression to it. Thus my pronounced feeling state involves cognition and conation.

Lastly, I shall find cognition and affect present in some measure if I examine a state which, at first sight, seems to be one of pure striving. Let us examine the case of a sprinter who is straining every nerve to win a race. There is cognition in that the sprinter knows what he is doing and is aware of his objective; and affect in that he experiences during the race hope, joy, and elation. These feelings, indeed, are the main-spring which keeps him going in spite of increasing fatigue.

Thus, although cognition, affect, and conation seem to be ultimate modes of experience which cannot be reduced to one another, it would be wrong to think or speak of them as if they had separate and independent existence. We can distinguish them in our thought, and we find them when we analyse our experience, but the products of our analysis do not exist in their pure states. It is necessary to realize this, and to guard, throughout our study, against a tendency we all have to hypostatize; that is, to reify abstractions, to create entities that do not exist. Hypostatizations are unavoidable, and they are frequently useful tools of thought, but they must be our servants, not our masters. In this instance we must realize that experience is one continuous thing, and that our three modes of experience are really hypostatizations, having no separate existence. We may see shortly some reason why experience should always present a threefold aspect.

Experience is fleeting and evanescent, changing continually from moment to moment. It has often been compared to a stream which flows on and on, so that the same drops of water never pass the same place again. We never have the same experience twice; two experiences must always differ in point of time, even if they differ in nothing else. But, although the "stream of consciousness" is an apt and useful metaphor, we should not think of talking of the "stream of the mind," for we feel that, below this fleeting and ever-changing stream

of experience, there must be something whose main attribute is permanence. Indeed, there is a whole host of mental phenomena, to explain which we require a hypothesis which will emphasize this permanent aspect of mind. Thus, as the second great division of our mental hypothesis we postulate a mental background or structure, behind experience and controlling it. We call it a structure because it is gradually built up as a result of the experience of the individual and of the race to which he belongs. "Mental structure is that enduring, growing framework of the mind which we infer from the observed manifestations of mind in experience and behaviour." ¹

We must observe carefully that the background or structure which we postulate is different in its very nature from experience, which may be said to be mental process or functioning. We ought not to be in any danger of confusing structure and function, for in any machine with which we are familiar structure and function are different things. Moreover, in the case of my own mind, I can observe the functioning to some extent, but I cannot see the structure at all; the only knowledge I can have of mental structure is by inference from mental functioning. McDougall makes this point clear by considering the example of a complicated mechanical toy, which reacts in a variety of ways under different conditions, observed by an investigator who is powerless to take it to pieces and examine the structure directly. Under these conditions he can only watch movements and hear sounds, inferring from these what the structure of the toy must be. This is, roughly speaking, the position of the psychologist who is examining the nature of mental structure. Again, we must not allow the word 'structure' to mislead us, for we are dealing with something mental, which has no existence in space like a material structure. Our use of the word in connexion with a poem or a symphony is perhaps helpful, meaning, as it does, something without material existence, "a whole consisting of parts in orderly functional relations with one another." ² If,

¹ McDougall, *An Outline of Psychology*, p. 41.

² *Ibid.*, p. 42.

however, it is necessary for the student to have some concrete mental picture of this structure there is no reason why he should not employ an image of the nervous system, provided that he does not rashly assume that the material nervous structure is the mental structure.

The main source of trouble is that, however we seek to describe our hypothesis, we cannot avoid the use of metaphors; the words 'background' and 'structure' bring in their train many ideas, some relevant, others irrelevant. Metaphors are dangerous things, and in psychology they are particularly apt to be misleading, since they are drawn from the material world. Yet they cannot be dispensed with, and, if we realize that they under-describe and over-describe at the same time, and if we are not afraid to mix our metaphors when necessary, no great harm need be done. Bearing these considerations in mind, and remembering that it is permissible to modify a hypothesis so that it may better describe our facts, we may proceed to a preliminary examination of our hypothesis of 'background' or 'structure.' The main point to be grasped now is that the 'structure,' whatever its nature, is part of a living organism, and that one of its essential attributes is activity; it is dynamic, not static. If it is difficult to think of a structure as active, not only rearranging its own constituent parts, but actually determining its own functioning, then we must realize that it is here that our inadequate metaphor breaks down. My active mental structure lies behind my experience and behaviour, determining what form they will take. It is my mental structure, for example, that determines me to experience fear in a dangerous situation, and to run away, or, at least, to experience an impulse to run away.

This hypothesis of mental structure has been accepted in recent years by many authorities in the psychological world, but different words have been used to describe it. Of such words 'disposition' is perhaps the most important. Stout, for example, points out that the psychologist is

compelled at every step to recognize the existence of what are called psychical or mental dispositions, inherited and acquired. Our actual experience at any moment is determined by conditions

which are not themselves actual experience, but the abiding after-effects left behind by prior experience.¹

McDougall also uses this word in a structural sense: in his *Social Psychology* ² he is inclined to limit it to the innate mental structure, along with its determining tendencies, but in a later work he means by 'disposition' "any enduring part of the structure of the mind which renders possible some particular mode of mental activity."³ It is in the latter more general sense that the word will be used here; a 'disposition' will denote a part of the mental structure having some degree of unity in itself.

There is yet another term which needs discussion at this stage—one which we approach with some diffidence, since it is used with so much confidence and so little understanding by every amateur psychologist. The term 'unconscious' seems to have been used first of all by the gloomy German philosopher Hartmann in his reaction from the philosophy which exalted consciousness as the supreme principle in the universe. He put forward the 'unconscious' as the supreme reality, and regarded it as a sort of malignant deity—perhaps we should say a sort of devil—that had sport with the lives of men.⁴ With his views we, as educational psychologists, are not concerned. Of greater interest and importance are the views of the psycho-analytic schools, who, realizing, as we all do now, that experience as we know it by introspection is quite inadequate to account for the observed facts of behaviour, introduced the idea of the unconscious as a sort of lower chamber or crypt of consciousness into which ideas and wishes passed, thus acquiring greatly increased potency over behaviour.

We need not here discuss the mass of contradictions and absurdities into which this two-chamber theory of the mind leads us, but, while respectfully acknowledging the great debt which we owe to the psycho-analysts for demonstrating the insufficiency of the 'consciousness' psychology, we can cordially

¹ *The Groundwork of Psychology*, p. 7.

² Pp. 29, 120.

³ *An Outline of Psychology*, p. 378.

⁴ Cf. Thomas Hardy, particularly the last sentence in *Tess of the D'Urbervilles*.

agree with those psychologists who urge that the time has come to define the term 'unconscious' in a way that will bear scrutiny. Following the authority of Dr James Drever, we shall use the word to denote the mental structure itself.

If the term 'unconscious' is to be employed in a specific and technical sense in psychology, it ought to be employed to designate those psychical determinants of experience or conscious process, which from their nature can never become conscious. We should then recognize the two types of mental fact, conscious process, and unconscious determinants of conscious process, or the conscious and the unconscious.¹

The unconscious differs from the conscious not merely in degree, but in kind, denoting facts of structure, not of experience or functioning. Thus, if we agree to this use, to talk of an unconscious experience or an idea 'in the unconscious' is to use a contradiction in terms. We may, if we care to do so, talk of a subconscious experience, meaning thereby an unapprehended experience, or one of which we are only dimly aware; but the word 'unconscious' cannot properly be used to qualify experience, as it denotes the mental structure that determines experience. Its main properties, its modification and organization, are topics which will occupy our attention in the following chapter.

We have, then, two main mental hypotheses: experience or the conscious on the one hand, and active mental structure, disposition, or the unconscious on the other, the active dispositions determining experience. It remains to inquire whether this doctrine can shed any further light on the three modes of experience: knowing, feeling, and striving. We saw earlier that the three modes are present in every experience; can we now find a reason for this, adding 'so must it be' to 'so it is'?

It will be helpful to consider, as an apparently simple example, the case of one of the lower animals taking notice of the external world and responding to it in a characteristic way; and we cannot do better than follow Lloyd Morgan² in

¹ *Introduction to the Psychology of Education*, pp. 22, 23.

² *Instinct and Experience*.

examining the behaviour of the moor-chick in presence of the barking puppy. A moor-chick is swimming tranquilly on a pond: suddenly, for the first time in its life, it is confronted by a puppy barking on the bank: immediately it ducks below the water. These are the facts, and a similar tale may be told about the innate modes of behaviour of any animal. What is their explanation?

The reader will hardly need to be reminded that one explanation offered is the mechanical one. We are told that the moor-chick is a complicated physico-chemical machine, and that the sight and sound of the puppy set it going in a particular way, just as the wind blowing on a weather-vane sets it in motion. We must reject this explanation, simply because it is inadequate to explain the facts of animal behaviour. The motion of the weather-vane can be accounted for by physical laws, but the behaviour of the moor-chick transcends them.

Another possible explanation would be to credit the moor-chick with the mental powers of a human being—the power to judge, to reason, to decide, to will. We should then have to imagine the animal thinking to itself: “Here is an enemy of my race; the best thing I can do is to get out of sight; the puppy will not see me if I duck beneath the water; that is what I will do.” Most of us would hesitate to apply this anthropomorphic explanation to the behaviour of an animal so lowly, for we have no reason for supposing that its mental powers are equal to our own. Certainly we do not intend to be flattering when we say that a fellow human being “has the brains of a hen.”

If we reject both of these explanations, is anything left us as a *via media*? It would seem that a third explanation is possible; and in it we find a clue, shadowy perhaps, to the explanation of knowing, feeling, and striving.

If we regard the moor-chick as a centre of energy, as a being pulsating with life-force, whose active mental structure is urging it forward to have commerce with the external world, we have little difficulty in seeing where the element of striving enters into experience. Conation, in the last analysis, is probably just this urge of the unconscious, and as such it must form

a part of every experience. But this forward-directed urge impels the animal to take notice of its surroundings in general, and in particular to notice anything likely to affect its own well-being. It is in this taking notice that we have the essential cognitive aspect of experience; all cognition must eventually spring from this elementary noticing of something outside. In our example the active mental structure of the moor-chick impels it to notice the puppy. Its eyes and ears are affected; nervous impulses are transmitted to the brain, where certain cells are made active. Coincident with these physiological happenings, and intimately connected with them, there are mental events: data are given to the mind, we might say. It is these data that constitute the cognitive aspect of experience. But the experience itself is neither the inner urge nor the cognitive data supplied by contact with the outer world; it is rather the meeting of the inner with the outer, the fusion of the two. Thus Drever seeks to give an objective account of experience, an account that is independent of introspection, describing it as a psychical synthesis or integration of two factors: (i) the conative element proceeding from the animal itself, and (ii) the cognitive element proceeding, in the last resort, from the external world.

The above account of experience as a psychical integration of conative and cognitive factors is incomplete as it stands, for we have still to account for the affective aspect. Drever maintains that affect is a central factor in every experience, that the fusion of the conative and cognitive factors always occasions a feeling-tone. In his view the moor-chick must experience a dim "feeling of worth-whileness" in its reaction to the situation. It does not experience a full-blown reasoning process about its dangerous situation; it merely feels—we should not say that it knows—that it is worth while to duck below the water. This feeling of worth-whileness is what the puppy means to the moor-chick; it is how it matters to it, how it interests it. Thus, as Drever maintains, feeling, meaning, and interest are, in the last resort, identical; and we may call this fundamental, central, affective aspect of experience a feeling of worth-whileness, primary meaning, or instinct interest, as we please.

Dr Drever has done signal service in indicating this middle view between the mechanistic and anthropomorphic explanations. An experience, let us repeat, may be regarded as a synthesis of conative and cognitive factors, the synthesis giving rise to a central affective factor. Drever supposes that the lower animals are dimly aware of the affective factor only, the other two not rising to the level of awareness. Thus the beginnings of conscious life lie in the world of feeling, and it is only higher up in the scale of animal life that the conative and cognitive aspects are apprehended. Yet, apprehended or not, all three are, from the beginning, necessary constituents of experience.

SUGGESTIONS FOR FURTHER READING

McDOUGALL : *An Outline of Psychology*, chapters i and ii ; *Psychology* (Home University Library), chapter i.

NUNN : *Education : its Data and First Principles*, chapter ii.

DREVER : *Introduction to the Psychology of Education*, chapters ii and iii.

PATRICK : *The World and its Meaning*, chapters vii, xii, xiii, xiv, etc.

STOUT : *The Groundwork of Psychology*, chapters i and iii.

HÖFFDING : *Outlines of Psychology*, chapters ii and iv.

CHAPTER III

THE POWERS OF THE MIND

To give some account of the general powers of the mind has always been regarded as one of the main tasks of the psychologist. The labours of a previous generation in this direction resulted in the description of the mind as a bundle of faculties—memory, attention, reason, judgment, and so on. But the faculty psychology is now discredited; it tended to conceal ignorance under a mass of names, and when in difficulties had only to invent new faculties in order to proceed with its task. Moreover, it obscured the essential unity of the mind, whose powers or modes of working were hypostatized and thought of as having independent existence. Now, to consider only one example, there is no such thing as memory in itself. Memory consists in some one remembering something, and is merely the name we give to a particular working of the mind or mode of experience. But, as Professor Spearman has wisely said,¹ faculties have a way of losing every battle, but always winning the war. The discarded faculties left a gap which later psychologists had to fill. Stout came forward with his “modes of being conscious,” while McDougall gave us the instincts. We must, then, take up the question and try to discover what are the most general and fundamental powers of mind—we dare not call them faculties. Although we have to speak of them separately, however, we must continually remind ourselves that they are merely aspects of mental life, and that they have no separate existence in themselves.

We remember, in the first place, that our main reason for postulating a mental structure was to provide a hypothesis which would account for those aspects of mental life whose main attribute is permanence. Thus the first general property of the mind is the power of conservation; and we shall

¹ *The Abilities of Man*, p. 38.

do well to follow Nunn in using the word 'mneme' to describe this fundamental attribute. Mneme, then, is the name given to the power of the mind in virtue of which the past is retained. No psychology can make a start without recognizing some such power as this. It is a general truth about living organisms that all life-process leaves behind it modifications of structure; we are our own history, both in an individual and a racial sense. This is emphatically true of our mental life; in our mental structures are conserved the after-effects of all our individual experiences, and probably many of the experiences of our ancestors also.

The first example of mneme that comes to mind is the common experience that we call memory, which will be discussed more fully in a later chapter. Meantime, let us note that memory obviously involves the retention of past experience. As I write I can remember a recent train journey; I could not remember it if I had not had the experience of the journey, and it is because of the conservation of something connected with that experience that I can now remember it.

But it is very important to realize that what can be remembered is only a small part of what is conserved. Mneme is a much wider term than memory, which is mneme risen to the level of awareness. When I am reading I do not say that I remember the letters of the alphabet, or my first reading-lessons, or even the meanings of the words. No doubt I have to do a certain amount of such remembering when I am reading a foreign language, but reading my own language requires no such actual memories. Yet it is clearly in virtue of my past experience that I am able to understand what I read. Here, then, we have an example of mneme operating below the level of awareness. Again, when I recognize a friend in the street I do not say that I remember his face; but again my recognition is possible only in virtue of past experiences in which my friend figured, and it is therefore a manifestation of mneme. A clear example of mneme without memory comes from the psychological laboratory. A subject is required to learn a series of nonsense-syllables until he can repeat them; some days later he is asked to repeat the series, and,

on failing to do so, is required to relearn it. This time he needs fewer repetitions than on the first occasion; and it is evident that, although memory has failed, something has been retained.

It seems certain that the lower animals have this power of *mneme*. Few people would attribute to them the power of conscious memory, but all investigations go to show that they are capable of learning by experience. In one experiment a worm is induced to enter a Y-shaped tube at the bottom, being given five trials daily. There is no reason at first why it should go to one arm of the Y rather than the other; and it is found that, when it comes to the parting of the ways, it goes as often the one way as the other. But let the experimenter arrange for it to suffer an electric shock in one of the arms; then, after a hundred trials, it nearly always goes to the arm where it will not get the shock. Thus even a worm has the power of conserving its own past.

More wonderful even than the power of the animal to retain its own past is its power to conserve the past of its ancestors. How else can we explain the remarkable instinctive behaviour of animals? We must go to the racial past to account for dogs turning round several times before they lie down, birds building their nests after a racial pattern and crossing the sea at particular places, eels going to a particular spot in the Atlantic to spawn, and many similar examples. Thus *mneme* operates in a racial sense. We too have this wonderful power of racial *mneme*. We grow up, for example, as if we remembered not only the bodily form proper to man, but also very much of the mental history of mankind.

Mneme, then, is the mind's most general power of retention. It is important to realize clearly what it is that is retained; nothing but confusion can result from supposing that the experiences themselves are conserved, going into cold storage, as it were, to re-emerge on a future occasion. Experience, let us once more repeat, is an activity of the subject, having no independent existence of its own. A present experience passes and goes for ever, and *it* can never come back. What is conserved is not the experience itself, but its after-effects. The

experience leaves behind it a modification of the mental structure; physiologists tell us that the actual brain-stuff is modified, and we must assume that the mental structure too is modified. We need a name for these modifications or after-effects of experience; we might call them memory-traces, but we shall rather adopt the useful word which Sir Percy Nunn has brought into current usage, and refer to them as engrams. An engram is the abiding after-effect, in the mental structure, of an experience: it is not an experience itself, but a disposition—a fact of structure, not of mental functioning.

We saw also in the previous chapter that an essential attribute of the mental structure is activity. The mental structure actively determines experience and behaviour, urging the individual to notice this rather than that in his environment, to feel in a characteristic way, and to do this rather than that. This activity of mind is a fundamental property of life, and is given various names by different writers, such as the will-to-live, the *élan vital*, the life-urge, the vital principle, and the libido. Perhaps a better term than any of the foregoing, since it does not postulate any theory of the nature of the urge, is 'horme,' first proposed by Nunn. He says:

To this element of drive or urge, whether it occurs in the conscious life of men and the higher animals, or in the unconscious activities of their bodies and the (presumably) unconscious behaviour of lower animals, we propose to give a single name—horme.¹

We shall define horme simply as the activity of the mental structure or unconscious.

Horme, under one name or another, is a fundamental postulate of Lamarck, Butler, Bergson, and Bernard Shaw, when they are expounding their views of the essentials of life and evolution. On this conception Nunn bases much of his philosophy and psychology of education; while McDougall has taken great pains to show that, in spite of many radical differ-

¹ *Education: its Data and First Principles*, p. 23.

ences, he and Freud have at least this in common, that they both uphold a hormic theory of psychology. In his epoch-making book, *An Introduction to Social Psychology*, McDougall does not actually use the word, but the idea of horme is implicit throughout his argument. Now he has adopted the term from Nunn, since it exactly expresses his meaning.

As with mneme, so again with horme we may find the most obvious example in our own conscious life. We are often acutely aware of the drive or urge or striving within us; what we call trying, desiring, striving, and willing—in short, all those mental states that are included under the term ‘conation’—are examples of horme come to the level of clear apprehension. But, just as mneme is a much wider term than memory, so is horme wider than conation. We may see horme in the behaviour of plants and of the lower animals. When the top of a young larch-tree is removed the topmost side-branch gradually raises itself until a new top is formed; and when a lizard loses its tail it grows a new one. We are tempted to say that the tree and the animal are determined to preserve a stable bodily form; but we can hardly suppose that they are aware of what they are doing. We may say, however, that it is the horme common to all life that impels them to behave in this manner. Again, in the preceding chapter we saw in the behaviour of the moor-chick an example of horme below the level of awareness, the animal being in all probability unaware of the striving, and experiencing only a dim feeling of worthwhileness. We have horme once more manifested in the activity of the solitary wasp, *Ammophila*, which, after stinging a caterpillar in such a way as to paralyse but not kill it, drags it to its nest, to ensure a supply of fresh food for its young when they require it; but the horme is again probably below the level of distinct awareness. It is only in the higher forms of life that the horme determines an apprehended experience of striving.

In our own physical and mental life examples of horme below the conscious level are not far to seek. We circulate our blood, we breathe, we digest our food, we do battle against disease; and all of these are hormic activities. When we cut

a finger, without any conscious effort we set processes in motion to regenerate the skin and heal the wound; when we cut our hair our hormone impels us, unconsciously, to grow it again. It is hormone that determines us to blink our eyes so that they are protected when a bright light shines into them; and to duck our heads, without any conscious conation, when a blow threatens. Hormone, then, is the second great characteristic of mind, and it operates at all levels of life, in both a racial and an individual sense.¹

For convenience of discussion hormone and mneme have been separated; but it must never be imagined that they have independent existence. They are mere hypostatizations, aspects of mental life that can be thought of separately for a little, but are not separate in reality. We may now profitably consider a third aspect of mental life which involves the operation of both the mnemic and hormic principles; using the term put forward by Drever, we shall call it cohesion. The engrams resulting from experience do not lie side by side, unrelated to one another, but cohere to form new wholes. They are active constituents of a living organism, and their hormic property is exhibited among themselves in the mental structure. Again following Drever, we may use the term 'endopsychic process' to describe this power of the constituents of the mental structure to arrange and organize themselves.

Now this fact of cohesion has been recognized for a long time in psychology in the famous doctrine of association of ideas. Unfortunately a very important principle was exalted into a complete explanation, for the associationist school tried to explain all mental life by means of it. Ideas were treated as independent entities which had the power of associating with one another. Psychologists, perhaps influenced by the advance of chemistry, tried to analyse the stuff of consciousness into its molecules and atoms, which they found to be ideas, images, and sensations. Then they sought to glue them together again, the glue being the principle of association, but the product was a most unconvincing account of mind as we

¹ For a detailed exposition of hormone the reader is referred to Nunn's *Education: its Data and First Principles*, chapter iii.

know it. The defect of the associationists was that they lost sight of the unity of the mind; the atoms and molecules they discovered were mere hypostatizations, and all the king's horses and all the king's men could not, out of them, build up again the original, complex whole.

Yet the associationists had laid their fingers on a tremendously important principle in mental life which our general doctrine allows us to restate in a less crude and mechanical fashion. It is the engrams, or after-effects of experience, not the ideas themselves, which have the power of associating with one another and of integrating into new wholes. Herbart recognized this integrating power of mind in his doctrine of 'apperception masses'; but it will be more in accordance with current usage if we call the combinations of engrams 'complexes.'¹

We must follow out some of the consequences of our assumption of cohesion, examining whether it agrees with the facts of mental life. Before doing so, however, it will be well to inquire by what principle it takes place. Which engrams cohere, and why?

The associationists gave a confident answer to this question, telling us that association takes place according to the law of contiguity. Those ideas, they said, which occur together, tend to associate. Thus, when I remember one thing that happened yesterday I tend to remember something else that happened at the same time, or shortly afterward. No doubt there is much truth in this principle, yet it misses the main point. We have only to compare, as regards strength, the associations formed between nonsense-syllables with those between the words of a line of poetry to realize that meaning is a tremendously important factor in association. It was Professor Stout who gave the death-blow to the barren associationism when he declared that the main principle is not contiguity, but continuity of interest. It is those engrams which matter to the subject in a particular connexion that tend to cohere.

The following homely example may help to clarify this

¹ A wider meaning of the word than the Freudian one. No 'repression' or morbidity is here implied.

important point. A young cat tried to be friendly with a charwoman, running after her broom and playing with her scrubbing-brush and soap. The charwoman, not appreciating these interruptions to her work, brutally hit the cat, who ever afterward was transformed into a veritable demon by the sight of a charwoman with her apparatus; indeed, it perforce became a rule of the house that he suffered solitary confinement on the occasion of her visits. Here we see evidence of the formation of a complex. The cat experienced together the sight of the charwoman, the sound of her voice, the pain, the fear, and the anger. Afterward it needed the recurrence of only one of these objects of experience to make him bristle with self-defence and attack the woman, his behaviour clearly showing that the engrams resulting from the primary series of events had cohered. Moreover, the bond was equally clearly one of interest, all these experiences mattering to the animal in a particular way; his interest in avoiding pain and in removing the threatening object had welded the engrams very firmly together.

The principle of cohesion enables us to explain certain familiar and interesting facts of mental life which are summarized in the proverb, "We learn to skate in summer and swim in winter." In the process of acquiring skill in any direction judicious intervals of rest seem to effect improvement, while in intellectual learning similar facts are evident. It is a well-known device to 'sleep over' a problem, whether it is one of conduct or of mathematics, the result being that it solves itself during the night. Now it needs more than freshness to account for this phenomenon of consolidation, as it is called. We must suppose that the engrams resulting from the attempts to acquire the skill or solve the problem continue their work of cohering and integrating in the background of the mind while the subject's attention is directed to other matters. Here again the principle of interest is of paramount importance. The more a person is interested in reducing his handicap or solving his problem—that is to say, the more an activity matters to him as an important mode of self-assertion—the more readily and quickly will consolidation take place. A strong desire to

succeed will always help consolidation. A student once reported to the present writer that, having decided to 'sleep over' a problem in mathematics which had fascinated him for several hours, he went to bed, and woke up in the small hours of the morning with the solution in his head. We can only suppose that the complex into which the engrams had consolidated was so active and anxious to burst into expression that it would not allow the poor fellow to enjoy his much-needed rest.

A similar explanation may be fitted to the facts of reminiscence, often noted, but now established on a sound basis by careful experiment. Dr Ballard proved that when a poem is learned more of it can be recalled after an interval of two days than immediately after the learning. This indicates that the complex relating to the learning of the whole poem must take time to consolidate; and two days would seem to be the most favourable interval.

The principle of consolidation also sheds light on the familiar experience of trying to remember something. We frequently try to recall a name, and have to abandon the attempt; suddenly, when we are thinking of other matters, the required name saunters into consciousness. What has happened? Our efforts have stimulated various engrams and complexes, which continue their work of consolidating after the attempt has been abandoned, and, when ready, throw the name into consciousness. The student may have noticed sometimes, during an effort to remember, a curious feeling that the wanted fact is just on the verge of coming into consciousness; this, in terms of our theory, must denote the semi-final stage in the consolidation of the relevant engrams.

These facts are familiar to anyone who studies his own mind, and they are important in the economy of all intellectual work. The experienced student knows that to plunge at once into an essay that has been prescribed is not to use time to the best advantage. A better plan is to let the subject simmer in the mind, to read round it, and to think about it every now and then. It is wonderful often, when the time comes for it to be written, how unexpectedly shapely it is; how relevant ideas

come pouring out thick and fast when the writer has allowed consolidation to do its work. Similar facts are noted by practised speakers; they know that it is important to have time to reflect, but they seldom commit everything to paper. The thinking and reflection at intervals result in the consolidation of a complex which governs effectively the speech when it comes to be made. The less practised speaker may well be advised to write out his speech, or at least to make full notes of it, and to abandon his manuscript on the occasion of giving it. Frequently the result is a finer thing than what has been written out.

A last example of consolidation may be seen in the acquisition of skill. At a first trial of any skilled action many unnecessary and irrelevant movements are performed, which, as practice continues, tend to be dropped, often without conscious effort on the part of the learner. Again, the complex governing the whole activity is sorting itself out, consolidating itself under the dominating principle of interest; those engrams that matter are consolidated, while those which do not drop out of the complex. In a famous experiment Thorndike placed a hungry cat in a cage in sight of food: it was possible for the animal to perform quite a simple action which would lead to freedom and the satisfaction of its hunger. At first the animal prowled round the cage, trying one thing after another; finally, after much trial and error, it hit on the right action and released itself. On subsequent occasions it was found that the cat succeeded more quickly, until at last it merely lifted the latch without any delay and walked out. Here we see the importance of a primitive interest in effecting consolidation. Further, each successful performance helps the work of consolidation: "Nothing succeeds like success" is a proverb embodying the truth of this doctrine. In the words of Sir T. Percy Nunn, "Successful self-assertion, in animals as in men, tends to modify its mnemonic basis in a direction favourable to still more secure and facile expression."¹

The educational importance of these facts of mental life is as clear as it is far-reaching. In all learning we must allow

¹ *Education: its Data and First Principles* (original edition), p. 46.

time for consolidation. Intervals of rest may be as important as periods of practice, whether the matter in question be a skilled movement or an intellectual activity. The young teacher need not be hopelessly discouraged if he finds, as he will, that at certain times his class seems to make no progress. Consolidation is going on beneath the surface, and if he has patience he will see the result of his labours in the sudden step forward that his pupils will take when the time is ripe. As we shall see later, certain stages of development seem to be Nature's periods of consolidation.

Finally, we must briefly examine certain results of the modification and organization of the mental structure. Let us return to the example of the cat and the charwoman. The first time the animal finds itself in the situation described, where objects are moving across the floor, he responds as his nature prompts him, trying to catch the moving objects and play with them. According to Drever, the cat has a feeling that it is worth while to respond in this way, and this feeling of worth-whileness is the meaning of the moving objects to him; he is impelled, in virtue of his inborn mental structure, to relate them to himself, so giving them meaning. We may call this innate structure, which prescribes a certain meaning to a certain situation, a primary disposition, and the meaning so given a primary meaning. But on subsequent occasions the meaning of the situation is different; instead of the original feeling of worth-whileness, the cat now has a feeling that it is worth while to attack the good lady. This is clearly a secondary meaning, and it is a product of his own individual experience, not of his original nature. The original primary disposition has become modified and enlarged; it has become a secondary disposition, and the meaning of the same sense impressions is now very different. Thus experience turns primary dispositions into secondary dispositions, and primary meanings into secondary meanings.

One might follow out at considerable length the consequences of the modification of primary dispositions; it is clearly a process that begins at birth and continues throughout life. Let it suffice now to point out that the meaning of a

situation is not inherent in that situation, but in the mind which perceives and responds to it. Meanings are continually being enriched, not because objects in the outer world change, but because the mind gradually becomes stored with secondary dispositions of ever-increasing fullness and complexity.

SUGGESTIONS FOR FURTHER READING

NUNN : *Education : its Data and First Principles*, chapters iii, iv, and v.

DREVER : *Introduction to the Psychology of Education*, chapter iii.

MCDUGALL : *An Outline of Psychology*, chapter ii.

CHAPTER IV

INSTINCT AND EMOTION

IN our attempt to examine the general powers of the mind we found two major functions—namely, horme, or the mind's general purposive activity, and mneme, or its power to conserve, consolidate, and arrange elements derived from past experience. But the mind as we know it possesses functions much more definite and precise than such general powers of noticing and responding to its environment and of conserving the past. From the first it is active in particular directions, impelling its possessor to notice this rather than that, and to do one thing rather than another. Even a young baby has definite impulses in definite directions; he does not, for example, need to learn to imbibe nourishment, or to yell when he suffers discomfort. We are born with the horme already differentiated and specialized, with our mental structure already organized into engram-complexes. In us is conserved not merely our individual past, but that of our race also.

The words 'instinct' and 'instinctive' are used to describe the facts to which we have referred—namely, that in certain specific situations there are certain specific, innate modes of behaviour which do not have to be learned, and which are common to all members of a species; and that therefore, in terms of our general theory, there must be certain innate dispositions, or engram-complexes, behind these modes of behaviour. How, then, shall we define an instinct? No glib definition can precede discussion and understanding, and we shall do well to lead up to a definition rather than start with one. But a provisional definition can be attempted. The way the word is used in ordinary speech is not particularly helpful: we hear it said, for example, that a good pianist puts his fingers instinctively on the right keys, that a mathematician

has an instinct for a neat method of solving a problem, and so on. But such uses of the word are extremely loose. Instinctive modes of behaviour are certainly those which are innate and have not to be learned, which are independent of schooling and individual experience. We might say that an instinct is an innate or inherited mode of behaviour. For example, in a dangerous situation we instinctively seek safety, and we might therefore talk of the instinct of escape. The chief objection to such a mode of definition is simply that the behaviour does not always take place. It would be better, since we have the power of inhibiting the behaviour itself, to define an instinct as an innate impulse toward a certain mode of behaviour; thus, in our example the instinct would be the impulse to run away. Such a definition would emphasize the hormic aspect of instinct. But it is equally possible and desirable to emphasize its mnemonic aspect, and to define it in terms of mental structure, saying that an instinct is an inherited or innate engram-complex or disposition, which determines its possessor to behave in certain specific ways in relation to certain specific objects. If we keep the word 'instinct' for the structure itself, thus emphasizing its permanent place in our mental make-up, we can talk of instinctive modes of behaviour and instinctive impulses to describe the other facts brought forward.

A simple example will make this clear. I am alone in a field; turning round, I see a bull approaching me, and I run as fast as possible to the nearest gate. The instinct is the innate disposition that lies behind my behaviour; the impulse to run is the instinctive impulse, and the actual running is the instinctive behaviour.

It is clearly a matter of urgent importance for the educator to know precisely what the human instincts are, since they must be the ultimate data of all problems of education. An appeal to authority is by no means decisive, for psychologists are still discussing which modes of behaviour are instinctive and which are not. Some put forward one or two instincts only, while others find as many as forty. A little thought, however, may enable us to explain this somewhat discouraging lack

of concord. The number of instincts depends merely on the degree of specificalness which is insisted on. The most general instinct of all is just the general disposition which impels us to notice our surroundings and to be active in relation to them; in other words, it is just the innate mental structure, taken as a whole, in its hormic and mnemic aspects. But, as we saw, there is probably no living being whose instincts are not more specific than that. All animals tend to notice this rather than that, and to do this rather than that. We have already seen an example of such endowment in the behaviour of the moor-chick. Thus the question is how far we ought to regard the various specializations of hormone as distinct from one another and worthy to be called instincts.

Very early in the upward march of evolution we find a bifurcation of the original hormone, the animal being impelled toward two different goals. First of all notice is taken of, and response is made to, those objects of the environment which are likely to affect individual well-being; secondly, those objects which are likely to affect the well-being of the species to which the animal belongs are attended to. Thus the animal has two main instincts, one of self-preservation and one of race-preservation; they are usually styled the instincts of self and sex respectively, although the meaning here given to the word 'sex' is much wider than the usual one. It cannot seriously be doubted that these two are the most fundamental instincts throughout the whole of animal life.

The question of the priority of the one or the other is of some interest. One school of psychologists has no hesitation in giving sex the place of primary importance in our mental endowment. Their argument is based chiefly on the findings of psycho-analysis, but further colour is lent to it by numerous instances of lower animals sacrificing their own individual lives in the interests of their race. This school, however, fails to do justice to the self-instinct: the truer view is probably that both instincts are powerful and equal branches of the original tree of hormone. This is borne out by a consideration of the amœba, which achieves the remarkable feat of self- and race-preservation at the same time. Immortality is the lot of this lowly animal:

it merely grows and splits into two, escaping death and propagating its species by one and the same act. At the other end of the scale, in man, we find the two instincts so well differentiated that they frequently conflict with each other, and impel the individual in opposite directions. This conflict is the well-worn but ever-interesting theme of most modern novels and plays. And yet even in the case of man there are considerations which point to the common origin of the two instincts. Founding a family is certainly an example of race-preservation, yet it is also an excellent means of self-preservation; and so long as a man has descendants there is part of him, even in a physical sense, that is still alive.

Side by side with these two there grows up a third impulse, one which furthers the well-being of the herd. Many animals are impelled to notice others of the same species, and to join themselves to those others. This herd instinct is neither so important nor so fundamental as the other two, and it has probably grown up in their service. A herd-impulse clearly helps the end of self-preservation; it also furthers race-preservation in that it brings about the pairing of suitable partners and increased chances of protection for the young. Human society is founded on this gregarious impulse, which is not, however, to be identified with social behaviour, for that is a later growth, involving altruism and self-sacrifice.

So far we have found three instincts of wide generality. They may be regarded, metaphorically speaking, as important branches from the tree-trunk of home, two of them large and important, the third somewhat smaller. But in the course of evolution the tree continues to grow, sending out more and more branches; thus in later stages we are able to distinguish further instincts. We must suppose, further, that our metaphorical tree has the power of joining branch with branch, forming a very complex whole indeed. Now clearly the number of instincts we shall find will depend on the height at which we take our cross-section. We have just taken it where we found two main branches with a subsidiary one; now we must take it somewhat farther away from the original stem. McDougall, in his classical exposition of the

subject,¹ studied the tree at the point where he found seven branches; in his later study,² however, he found fourteen branches important enough to be called instincts.

For McDougall an instinct is an innate or inherited mental structure which determines its possessor to perform certain specific actions in certain specific situations. Thus the instinctive disposition is organized on its cognitive side so that it is stimulated into activity by a specific excitant; and on its conative side so that one action rather than another is performed. He likens the instinctive disposition to a lock that can be opened only by the appropriate key—namely, the specific stimulus to which it, by its innate organization, can respond. In order that any disposition may be called an instinct, it must be innate, common to all the members of a species, and even found in the higher animals as well as in man. We shall briefly summarize McDougall's findings here, but the student is warned that no summary can be an adequate substitute for first-hand study of the original and intensely interesting account of the matter.

(i) First of all McDougall describes the parental instinct, "Nature's brightest and most beautiful invention," "the mother of both Intellect and Morality." The most primitive key to this instinct is the sight, sound, or smell of the animal's own offspring, but especially their cry of distress. The instinct, when aroused, impels its possessor to protect the young or to supply them with food. Now in man at least this instinct is capable of endless modification and development. The impulse to protect and cherish is awakened in us by the sight, or even by the thought of any fellow-creature in weakness or distress; and the protection takes any form from guiding a child or an old lady across a busy street to passing Acts of Parliament for the prevention of cruelty to children.

(ii) The instinct of combat is aroused most readily by a threat to the young—that is, by a situation which interferes with the working of the parental instinct. But it is aroused also by interference in the pursuit of any instinctive goal; thus, for example, obstruction to the food-seeking impulse will readily

¹ *An Introduction to Social Psychology.*

² *An Outline of Psychology.*

arouse combat. The combative impulse seeks primarily to get rid of such an obstruction; and it is only when this is unsuccessful that destruction is aimed at.

(iii) Curiosity, like combat, becomes active in connexion with other instincts. When an object or situation resembles one that would invoke the activity of another instinct, but is not apprehended sufficiently clearly to do so, the instinct of curiosity is unlocked. Its impulse is to seek fuller apprehension and more complete knowledge of such an object or situation; this it does by urging its possessor to approach and examine the object or situation. We see it clearly in the behaviour of a cat, who, on perceiving a small, moving object resembling the mouse which would awaken its food-seeking impulse, approaches it and paws it, so becoming acquainted with its characters.

(iv) Food-seeking, says McDougall, "was presumably the first tendency to be differentiated from the primal purposive energy or *élan vital*." It is clearly the first requirement of self-preservation. It is aroused into activity by the sight or smell of food, and also by a certain state of the digestive organs. Thus we have here an impulse which has reference not only to outside objects, but also to bodily states; using Drever's useful terms, we may say that it is 'appetitive' as well as 'reactive.' The specific impulse is, of course, to seek food and to devour it.

(v) Repulsion is, perhaps, the simplest of all the instincts. The most primitive key to it is the presence of something nasty in the mouth, and its most primitive response is the ejection of the offending article. But, clearly, in man this impulse shows itself in many more lofty ways: it can be refined to a disgust of cruelty, lying, and all forms of wickedness.¹

(vi) The instinct of escape is unlocked by a variety of keys, but of these perhaps the most important is a loud and sudden noise. Others are a sudden movement of a large object, the

¹ The continuity of the primitive and elevated forms of this instinct is well illustrated in the vigorous language of the Authorized Version: "Because thou art lukewarm, and neither cold nor hot, I will spue thee out of my mouth."

danger cry emitted by other members of the species, bodily pain, and, in general, the mysterious and the uncanny. The impulse is to run for shelter and to lie hid, the activity usually being initiated by a cry of fear.

(vii) The gregarious instinct is stimulated by the sight of other members of the species, the hearing of specific cries, and the smelling of specific odours. The animal responds to such stimuli by seeking the near presence of the others. It need hardly be pointed out that in man the idea, apart from the actual perception, of others is sufficient to make the instinct active.

(viii) Self-assertion is an important instinct which is stimulated into activity by the presence of inferior fellow-creatures. It results in a display of strength, or of superiority in some direction, in strutting or 'showing-off.'

(ix) Self-abasement is the complementary instinct, evoked by the presence of a superior member of the species. It is accompanied by an impulse to crouch and cringe, and generally to adopt an attitude of deference. This instinct is seen operating in its pure form in the behaviour of the domestic dog when he returns from an adventure in which he has done many things that he ought not to have done.

(x) The mating instinct—that is, the sex instinct in the narrow sense—is aroused by the presence of a suitable member of the opposite sex and by the perception of bodily sexual characters. This instinct, like food-seeking, although reactive toward objects in the external world, is also appetitive, since its activity depends partly on a state of the body. The school of Freud, as is well known, makes this instinct the fundamental fact of psychology.

(xi) The acquisitive instinct has for its key the presence of material suitable especially for food or for furnishing the home. Its impulse is sometimes merely to take possession of the material, sometimes to guard it jealously as well. This instinct, of course, is highly developed in the miser.

(xii) The constructive instinct in turn is aroused primarily by the presence of material suitable for making nests or building houses. The animal is impelled to make a nest or a home

of some kind. We see very clearly the working of this instinct in the behaviour of children when they make shelters, build houses, or adorn caves, using any material that may be at hand.

(xiii) The instinct of appeal is awakened when the instinct of combat fails to attain its goal. We saw that combat itself is aroused when any other instinct is thwarted: and when combat itself fails to deal with the situation the animal can only summon help from others, especially its parent. This it does by uttering a cry of appeal.

(xiv) Laughter, if it is an instinct, is the only one peculiar to the human species. What is the key which unlocks this curious instinct? McDougall tells us that it is a situation which would either annoy or distress us if we did not laugh. Laughter is an antidote to anger on the one hand and sympathy on the other. When we see another in a painful situation either we sympathize or we laugh. Now, if we were always sympathizing we should have to share the pain and sorrow of all with whom we came in contact; so Nature, in order to avoid this unbearable state of affairs, has invented laughter as an alternative reaction to such situations.

Such, in very brief outline, is McDougall's account of our innate tendencies. One point in particular must be emphasized in view of certain criticisms that have been levelled at the doctrine. The instincts are not regarded as separate faculties of the mind, but as local differentiations of the animal's general power to apprehend its environment and to be active with regard to it.¹ They are merely branches from the original tree of horne. Thus the mind is more than a bundle of instincts; it is an organism, a unity, of which instincts are merely aspects which can be thought of separately but have no discrete existence. They are not mechanisms to which the mind is enslaved, but special activities of the mind, particular ways in which the mind is active. But no fair-minded critic can read *An Outline of Psychology* and accuse its author of losing the whole mind in his study of the instincts. Again and again is brought out the fact that one instinct has grown up in the

¹ See Nunn, *Education: its Data and First Principles*, p. 157.

service of another. Thus combat grew up in connexion with all the other instincts, especially the parental instinct. Food-seeking too is closely connected with the parental instinct, while repulsion clearly grew up along with food-seeking. Self-assertion and submission are connected with the gregarious instinct on the one hand and with mating on the other. Further, to anyone who maintains that there are more instincts than McDougall's fourteen the reply is simple: we have merely to say that the tree can branch out more fully, but that in our account we do seem to have enumerated the *principal* innate tendencies of the race.

Before we turn to the educational application of McDougall's doctrine we must face a question of considerable importance both theoretically and practically—namely, the place of emotion in instinct.

Perhaps the most distinctive feature of McDougall's argument is his insistence on a specific emotion being the central, essential, unchanging aspect of every instinct. Thus, he says, the emotion of fear is the central aspect of the instinct of escape, anger the invariable concomitant of combat, and so on. He bases his argument on common-sense considerations, pointing out that when we are looking for motives in the behaviour of the lower animals we invoke the principle of instinct, but when we do so in man's behaviour we invoke emotion. Thus we say that it is instinct which impels an ant to go through its wonderful cycle of activities, but that it is anger or pride or fear that makes a man behave in a certain way. In the case of a dog we may invoke either principle: when his behaviour is unintelligent we are apt to ascribe it to instinct, but when we think we can impute motives similar to our own we explain his actions in terms of emotion. Common sense, then, says that motives, in man and the higher animals, are emotions; that in the lower animals they are instincts. Does Nature, then, have two principles of action, emotion and instinct? Has she in the course of evolution scrapped the principle of instinct that has worked so beautifully and substituted another for it? No, says McDougall, the principles are one and the same. He points out further that common

sense frequently identifies the two by giving them the same name, as in fear, curiosity, and disgust. He thus regards emotion as the mode of experience that accompanies the working of an instinctive impulse.

Any definition of instinct, then, which omits this essential element of emotional experience is bound to be incomplete. According to McDougall, an instinct is "an innate disposition which determines the organism to perceive (to pay attention to) any object of a certain class, and to experience in its presence a certain emotional excitement and an impulse to action which find expression in a specific mode of behaviour in relation to that object."¹ He is able to ascribe a specific emotion to practically all of the fourteen instincts already enumerated. An emotion which accompanies the working of an instinct is a primary emotion; other emotions are secondary, being regarded as blends of two or more primary emotions. The following is McDougall's list of the instincts with their emotions.² It is arranged in descending order of definiteness of the accompanying emotions.

<i>Instincts</i>	<i>Emotional Qualities accompanying the Instinctive Activities</i>
Escape	Fear
Combat	Anger
Repulsion	Disgust
Parental	Tender emotion
Appeal	Distress
Mating	Lust
Curiosity	Wonder
Submission	Negative self-feeling
Self-assertion	Positive self-feeling
Gregarious	Feeling of loneliness
Food-seeking	Gusto
Acquisition	Feeling of ownership
Construction	Feeling of creativeness
Laughter	Amusement

Before discussing this view further it would be well to realize clearly what is meant by emotion. We all know what

¹ *An Outline of Psychology*, p. 110.

² *Ibid.*, p. 324.

it is to be angry or afraid or elated; and it is just those modes of being conscious in which the feeling element is predominant that we call emotional states. Moreover, one emotional state differs in quality from another; being angry, for example, is not the same thing as being afraid. Here, as ever, we must beware of our tendency to hypostatize. Anger and fear are not entities that come on the scene and possess the mind, but are only the names we give to certain well-defined states of our consciousness.

We may use the word 'emotion' in a simple, narrow sense, meaning merely the feeling-tone of a particular quality, the affective colouring of experience that we find by introspection; or we may give it a fuller, more complex meaning. In any pronounced emotional state there is more than this well-defined affective tone; there are, in addition, perturbations of the body, expressions of the emotion, "organic resonance," and also a conative factor, an impulse to do something. Feeling and conation are closely connected, as Stout recognized long ago. There is no doubt that the complex meaning gives the better description of an emotional state.

The bodily changes that are so essential an element of emotional states are the adjustments which favour the execution of the instinctive activity with which that emotional state is correlated. Thus in a state of fear the body prepares itself in every possible way for swift locomotion; in anger for successful combat. These changes are characteristic of each emotion, and have recently been discovered to be much more complicated and far-reaching than was hitherto suspected. We shall quote only one example of the wonderful way in which our bodies 'back up' our emotional states. Physiologists have discovered that in a state of anger or fear the adrenal glands secrete a substance, adrenalin, and throw it into the circulation of the blood. Along with other effects, this substance gives the blood increased power of coagulating, and so lessens the danger of bleeding to death from wounds. Now the great psychologist James, who wrote before this wonderful discovery was made, stressed, notwithstanding, the bodily accompaniments of emotion. Along with Lange

he put forward the celebrated James-Lange theory: that emotional experience is nothing but the experiencing of the organic changes produced by the evoking stimulus; really that emotions are of the same nature as sensations, that they are merely an apprehension or knowledge of changes going on in the body. James put the matter somewhat paradoxically when he said:

Common sense says, we lose our fortune, are sorry and weep; we meet a bear, are frightened and run; we are insulted by a rival, are angry and strike. . . . The more rational statement is that we feel sorry because we cry, angry because we strike, afraid because we tremble, and not that we cry, strike, or tremble, because we are sorry, angry, or fearful, as the case may be.¹

Among the astonishing discoveries made by recent workers of the complicated bodily accompaniments of emotion are profound changes in respiration and circulation and in the activities of the ductless glands. Nerve-centres outside the cerebro-spinal system, and independent of it, are involved in the changes, and an affective centre for the cerebro-spinal system itself has been discovered in the thalami, ganglionic masses lying at the base of the cerebrum. In short, physiology can now give a detailed description of emotion from the bodily standpoint. There can be no doubt that these bodily activities are essential to all emotion, and that the different qualities of different emotions are at least partially due to different bodily states. But this is not to say that emotion is nothing more than an apprehension of these states, still less that the bodily states are the emotion, as the behaviourists would have it. The feeling-tone and the experienced impulse are equally essential. It is, after all, probably more true to say that a man ran away because he was afraid than that he was afraid because he found himself running away. Yet there is no justification for pouring scorn on the James-Lange theory; recent work has at least shown that the bodily states are even more essential elements in emotion than had been suspected.

This brief account of emotion has clearly many points in common with the account of instinct, the chief difference being

¹ *The Principles of Psychology*, vol. ii, pp. 449, 450.

merely one of stress. Is McDougall, then, correct in his view that the primary emotions are just the instincts viewed from another standpoint? On this point perhaps his most able critic is Dr James Drever. We need not here enter into the whole argument, which is based partly on what is known about the bodily accompaniments of emotion. Drever's conclusion, however, is that emotion is not essential to the working of an instinct, that it comes on the scene only when the instinctive activity is baulked. We can, it is true, point to some of the instincts we have discussed—to construction, for example—and ask what satisfactory emotional correlate can be found for it. But Drever goes further: pointing to the instinct of escape, he argues that the correlative fear is not always present. Rivers, another eminent psychologist, has shown that one response to the danger-situation is manipulative activity, that in a situation of extreme danger we instinctively perform wonderful actions with our hands, and indeed with our whole bodies, which astonish ourselves as well as others. The cliff-climber in peril will frequently do just the right thing to extricate himself, and the cyclist in a traffic jam will often, without thinking, do just what is needful. Rivers further points out that, when this instinctive manipulative activity is proceeding successfully, no emotion appears on the scene: fear supervenes only when the activity ceases to be successful. Now Drever maintains, along with Rivers, that this coincidence of manipulative activity and absence of affect is a general law which applies to all the instincts. Dr William Brown, too, points out that McDougall tacitly admits this himself in the case of at least one of his instincts; for the gregarious instinct the corresponding emotion is "feeling of loneliness," which is clearly what one experiences when the instinct is not successfully working toward its goal. The law applies to innate and acquired tendencies alike; thus in a difficult situation we get flustered only when we do not know what to do or say.

Drever, however, admits that it is characteristic of the more fundamental instincts that an emotional perturbation arises with extreme facility, and even that it is normally involved in the instinctive response. But he maintains stoutly, nevertheless,

that emotions as such are not the affective element in instinct; for him the normal affective element is merely the feeling of worth-whileness, which is fanned into an emotion only when the activity is not proceeding smoothly.

McDougall seems to have accepted some of the criticism, for his scheme is now less rigid than that propounded in *An Introduction to Social Psychology*. But he still insists on the primacy of emotion. He admits that what Drever says is true of anger, but not of other emotions; he admits too that we do not become explicitly aware of our emotions so long as we give ourselves wholly to action, but he maintains that they are there, qualifying all our experience while we strive. We can find them if we introspect.

If the instinctive disposition is so constituted as to be capable of generating the appropriate emotion when its impulse is denied immediate satisfaction, it is difficult to see any theoretical ground for denying it this capacity when its activity is unobstructed; nor does inspection of the facts seem to me to yield any more evidence in support of this view than the theoretical consideration of the possibilities. Surely it is merely a matter of degree of intensity of the emotional excitement.¹

Nunn pours oil on the troubled waters and points out that the question is really one of more or less. He looks on the emotions "as local differentiations of the feeling that colours all the organism's hormic dealings with the world." He says:

It is true that in solving a scientific problem or in repaying a good turn I am not swept along all the time on a full stream of wonder or gratitude. Nevertheless, the 'worth-whileness' experienced in such activities does seem in each case to be coloured, so to speak, with the same colour as the emotion.²

Drever undoubtedly pushes his criticisms too far, for the distinction is one of degree rather than kind.

The justification for this long discussion of instinct and emotion is the extreme importance of the subject. All McDougall's critics agree with him that the instincts and emotions are funda-

¹ McDougall, *An Introduction to Social Psychology*, 14th edition, Preface.

² *Education: its Data and First Principles*, pp. 157-158.

mentally important in the study of behaviour, and that therefore they are of profound consequence in educational theory and practice. The instincts are the raw material of character, and throughout his task the educator must deal with them.

In the first place, the educator must work with the grain, not against it; and the account of instinct just given, if it is reasonably near the truth, should give him a working idea of how the grain lies. He must realize that the young child is behaving on the instinctive level, and that the most powerful motives—one might almost say the only ones—to which he can successfully appeal are the instincts. It is futile in matters of conduct to appeal to a moral sense that is not there; rather the aid of the instincts of repulsion, escape, self-assertion, and submission must be invoked. No doubt it is unwise to make continual appeal either to fear or to self-abasement; the conscientious educator could hardly wish these instincts to be unduly stimulated. Yet they are parts of the child's mental make-up, and it cannot be entirely wrong to utilize them in his early education. To thwart a child who is quite innocently following out an instinctive activity is very unwise, and is provocative of extreme anger, as we all have observed; the best way to get him to abandon one instinctive activity is to substitute another for it.

Again, in the early stages of intellectual education appeal must be made through the instincts; we must make a start by utilizing the motives that are there. Perhaps the most useful of all is the instinct of curiosity, the greatest ally the teacher has. If he can present his matter in a way that will appeal to this instinct the problem of obtaining attention is solved. Of course, crude curiosity does not lead us far—guessing competitions are not fruitful of good intellectual work—but it does give us a starting-point, even in its undeveloped form. Again, the constructive instinct should be utilized by the teacher; every teacher of experience knows the value of allowing children to make things. We could go through the whole list of instincts, working out the place of each in moral and intellectual education, but space forbids; in any case, the exercise is better left to the student himself.

It must be noted, of course, that the instincts, though innate, are not fully developed at birth. Each appears inevitably at its proper time. Moreover, there seems to be a period of maximal activity in the development of each instinct; for example, the collecting and gregarious instincts come to fruition normally during the years of boyhood. James has called attention to a law of transitoriness of instinct, which he formulates thus: "Many instincts ripen at a certain age and then fade away."¹ Modern psychologists, however, would hardly agree with the latter half of this 'law'; fading away is never the fate of an instinct. But the teacher must realize that certain favourable chances occur which will not occur again; he must, therefore, 'strike while the iron is hot.'

It must not be imagined, however, that the task of the educator is merely to work with the instincts. These instincts, as we have seen, are the bricks out of which the individual's character is fashioned; the educator meets them in their crude form, and it is his great task to transform and purify them. How can this be done? Well, man is not the slave of his instincts. Bondage to instinct is rather the lot of the ant and the busy bee, whose extreme efficiency is so often held up as an example to us, but who, if they were not carrying out certain stereotyped activities, would be doing nothing at all. The difference between man and these lowly creatures is so great that it has been possible to maintain that the (former is guided by intelligence, the latter by instinct.) But there is no justification for assuming that Nature, somewhere in the ascent from lower to higher forms of life, adopted a new principle. McDougall has shown convincingly that the behaviour of insects, though relatively stereotyped, really involves the co-operation of intelligence to some extent. The real difference lies in the fact that, whereas the lower animals can respond instinctively to one object only, and in one way only, the instincts of man are indefinitely plastic and adaptable. No doubt there is usually one object which, more readily than another, awakens an instinct, and one response which, more readily than another, takes place; but other objects and other re-

¹ *The Principles of Psychology*, vol. ii, p. 398.

sponses can be and are substituted. It is because his instincts are so plastic, on both their perceptive and conative sides, that man is educable. The lower animals, for all their perfection of adjustment, can do only one thing well. But man is free to use his instinctive equipment as he will. To say that man is enslaved to his instincts, when he has unlimited scope for re-directing their energies, is nonsense.

'Sublimation' is the word used to describe the process of re-directing an instinct from its primitive, biological goal to one that is socially and individually uplifting. It was originally used by the Freudians with reference to the sex instinct, but it can clearly bear a wider meaning. Curiosity, for example, may be sublimated from the impulse to pry into useless and even undesirable objects to an enthusiasm for the wonders of science. All science begins in wonder, and the whole fabric of modern science is a monument of sublimated curiosity. Fear of bodily pain may be sublimated to fear of wrong-doing, to fear of the things which "hurt the soul." The crude gregarious instinct, along with the parental instinct and the instincts of self-assertion and submission, may be sublimated to the highest forms of social behaviour. There is no need to labour the point. The whole task of education is to sublimate the instincts.

The teacher, then, must realize that instincts are factors to be reckoned with; moreover, that nothing but harm can come from attempting to suppress them. Inconvenient instincts cannot be dealt with in this summary fashion. To suppress an instinct is not to destroy it; denied direct expression, it will assert its activity in undesirable ways that are beyond the control of the will. This part of the subject will be dealt with in a future chapter.

What of the affective aspect of instinct, the emotions? There can be no doubt that the somewhat meagre results achieved during the first half-century of popular education are due to an overemphasis on the intellectual side of the mind and a corresponding neglect of the emotions. In the modern psychology of education, however, the emotions occupy a prominent place, and the advance in method that is now taking place is due to this perhaps more than to any other factor. Emotions are the

dynamic of all our actions, and the educator must take account of them. How is he to do it? Without anticipating our more general discussion of interest in education, we may say that, even in intellectual matters, the emotions can by no means be neglected. The teaching of mathematics, for example, if it is to be successful, must make its appeal to the emotions of wonder and positive self-feeling. But, further, one of the recognized tasks of modern education is to deal with the feelings directly, (to instil a love of the beautiful, to foster appreciation of art, literature, and music. We may fittingly close the present chapter with a few remarks on this important topic.

'Taste' is defined in the *Oxford Dictionary* as the "faculty of discerning and enjoying beauty or other excellence, especially in art and literature." Feeling is the most important element in taste, although cognition and conation are by no means absent. It is, perhaps, because of this that the notion of beauty is so difficult to define. Some will have it that the beautiful is only a matter of convention and fashion, but surely it is more than this—something beyond ourselves, something absolute which we can discern if we will. We have the power of recognizing beauty when we see it, and a thing that is once beautiful is always beautiful. The more one knows and loves music, for example, the more one can say with confidence what is beautiful in this sphere, and what is not; and one's opinion does, as a matter of fact, agree with that of other equally competent critics.

How can we train children in this power to discern the beautiful? Plato said: "We require to be trained from our earliest youth to feel pleasure and pain at the right things." True education is just that." We may profitably attack this question from the threefold standpoint of affect, cognition, and conation.

The affective aspect of training in taste is supremely important: we must train our pupils to feel aright. The work of the teacher in this direction is mainly the provision of opportunities for the right exercise of feeling. He must put before the child things which it is desired he should admire in literature, art, and music; further, he must keep from him, as far

as possible, what he ought to dislike and avoid. If a child is accustomed to beautiful things his taste will be unconsciously cultivated. "These will grow into his soul, there unconsciously to erect standards of goodness and beauty, to cultivate a healthy taste, which will make their opposites repellent to him."¹ The teacher must, of course, have regard to his pupil's capabilities at a given age. The cultivation of taste is a gradual process, and the results achieved depend on the stage of development. Experimental psychology confirms what we should naturally expect, that the beginning of adolescence is a favourable period.

What is the intellective aspect of training in taste? The teacher must be very careful here, for direct instruction will largely defeat its own ends. He must not lay down laws in the matter, saying, "This is beautiful, that is ugly. Like this, and dislike that." And yet taste cannot be fully developed apart from knowledge. There are standards of taste, valid for more than one person, and knowledge of these is necessary. It is desirable, having felt the beautiful, to analyse its conditions and arrive at some general principles. Sir H. Walford Davies, in his wireless talks on music, does this with conspicuous success. Our intellects impel us to seek reasons for beauty when we find it: the receptive attitude naturally becomes an analytical and critical one. No teacher, however, must think that any knowledge of standards and canons of criticism can be a substitute for feeling, for if that is absent all talk about the beautiful is mere cant and humbug. But, this condition being fulfilled, the teacher, without adopting a didactic attitude, can do much to help his pupils to perform elementary analyses of conditions of beauty. He must never force expressions of taste: if they come naturally he will accept them, but he must not demand them. If a child wishes merely to feel the beauty of a poem he must not be compelled to talk about it, or to give reasons. Success in appreciation lessons cannot be assessed by the method of question and answer, excellent though that method may be in intellectual matters.

¹ Plato.

Although the method of direct instruction must be sparingly used, the teacher has much more powerful weapons at his command in the forces of sympathy and suggestion. By sympathy his own feelings are communicated, and by suggestion his own ideas on the beautiful are directly transferred to the pupil, the latter not realizing their true source. It follows that the teacher must have true taste himself, or he cannot be the means of implanting it in children. Pupils will tend to enjoy what a sympathetic teacher enjoys; they will always 'catch' an attitude of genuine enthusiasm. But sham enthusiasm is of no avail; it is the real attitude of the teacher that is effective, not what he says.

Lastly, we may inquire what is the place of doing and striving in the cultivation of taste. It is generally agreed that people who play ought to be good judges of music, and that people who write ought to be good judges of literature. But concert-goers and enthusiastic readers rightly decline to allow the executants, the composers, and the writers sole power of judging. We may admit, however, that intelligence in judging is increased and feeling is fostered by successful imitation of works of art, especially if that imitation gives way to creative effort. Now most of us, if we try, can play or sing a little, draw and paint a little, write a little; and our efforts, whatever their objective value may be, will aid the cultivation of our taste. Thus we should encourage our pupils, by all the means in our power, to be young musicians, essayists, poets, and artists, not judging their efforts unsympathetically. The danger lies, of course, in thinking that in doing this we are necessarily cultivating a love of the beautiful. It is quite certain that admiration of a work of art is compatible with entire inability to produce anything; and it is equally certain that undue emphasis on the practical element in the cultivation of taste may produce an admiration of mere technique, which is not taste at all. But attempts at performance do help at least the intellectual analysis that guides the formation of taste.

The ideal, of course, is to create works of art oneself; but in practice the possibility of successful achievement seems to

be confined to the few. One may say in passing, however, that under the right conditions children make surprisingly fine efforts in this direction. But the school cannot cater for the education of immortal artists, poets, and composers; the most it can do is to provide conditions which will not impede the development of any potential genius who may appear. Yet it is given to all to appreciate works of art with some degree of fullness, and, psychologically speaking, there is always a 'doing' element in genuine appreciation. When a poem is read and enjoyed it is, in a very real sense, remade by the reader. The sympathetic reader takes the printed page, which, after all, is only a record of the poet's creation, not the creation itself, and transfigures the mere possibility of a poem into a glowing masterpiece, co-operating, perhaps, with Shakespeare himself. In this sense a 'doing' element is essential to all appreciation.

SUGGESTIONS FOR FURTHER READING

- McDOUGALL : *An Outline of Psychology*, chapters ii, iii, iv, v, xi, and xii ;
An Introduction to Social Psychology, chapters ii and iii.
DREVER : *Instinct in Man ; Introduction to the Psychology of Education*, chapter iv.
NUNN : *Education : its Data and First Principles*, chapter xi.
RIVERS : *Instinct and the Unconscious*.
SANDIFORD : *Educational Psychology*, chapters vi and vii.
JAMES : *The Principles of Psychology*, chapters xxiv and xxv.
PRITCHARD : *Training in Literary Appreciation*.
HAYWARD : *The Lesson in Appreciation*.
CLUTTON-BROCK : *The Ultimate Belief*.

CHAPTER V

HEREDITY AND EVOLUTION

WHEN we ask the question, "How do instincts originate?" we come face to face with the problems of heredity and evolution. Instincts, we saw, are innate or inherited; further, since they developed, in all probability, as the race developed, they are the products of evolution. But we cannot be content to use such words without exploring their meaning, for learned words are often merely a means of concealing ignorance. An effort, therefore, must be made to understand these terms, even though we may arrive at no very satisfactory answer to our queries. We shall probably be aided in our search by seeking and accepting a contribution from biology; incidentally, we shall get much light on psychology as a whole, and on many questions of educational interest and importance.

'Heredity' is a word used to cover a number of familiar facts which may be summed up in the proposition that "like tends to beget like."¹ It is a generalization from experience to say that children receive mental and physical traits from their parents. In our common speech we frequently say that a youth is "a chip of the old block," that he "takes after his mother's family." The ordinary person does believe in good stock and in the potency of heredity for weal or woe.

We may say at once that we are apt unthinkingly to attribute to heredity much that is due rather to environment, for the seeming inheritance of many of the father's characteristics by the son may well be due to the latter having been brought up with the father. But when every allowance has been made for such exaggerations of inheritance the fact of heredity remains a stupendous miracle. We must realize that heredity, as Professor MacBride says,² is a misleading metaphor drawn

¹ Thomson and Geddes, *Evolution*, p. 114.

² *Evolution*, p. 11.

from human laws of succession in property. We do not receive our bodies from our parents, but only a germ which, by some mysterious process, grows into a human being. The idea that the original germ contains minute copies of all the parts of our body, which have only to grow, is now exploded. Moreover, the germ with which a dog, for example, starts life is practically identical with the human germ: yet the one develops into a dog, the other into a man, each repeating the characteristics of his parents in millions of details. Why should this be so? The parents of the one are canine, of the other human; but why should this cause such a vast difference in the development of the two similar germ-cells?

It was thought that Weismann's theory of the continuity of the germ-plasm would make the matter clear. What is this theory? Galton in 1875 pointed out that the child is, in a sense, as old as the parent—indeed, as old as his remotest ancestor. The student will be aware that the body grows by the multiplication of cells from the germ-cell. Now, at a very early stage in this process certain cells are set apart, unaltered, to form the reproductive cells in the new individual, one of which, therefore, may become the starting-point of another human being. These reproductive cells take no part in the development of the body, and are continuous from one generation to another. "Thus the parent is rather the trustee of the germ-plasm than the producer of the child."¹ Weismann developed the idea, and the theory is now associated with his name.

Some have thought that in this continuity of the germ-plasm we have an explanation of why like tends to beget like; but the explanation is too superficial to be regarded as satisfactory. The germ-plasm is only relatively continuous; it is not there, separate from the rest of the individual, at the very beginning of development. Then again, to maintain that, although it is constantly increasing in amount, the process of growth is continuous, is to state rather than explain the fact of heredity. We might say that successive generations have similar forms because they spring from similar, not the same, germ-plasm; but if we would explain heredity on these

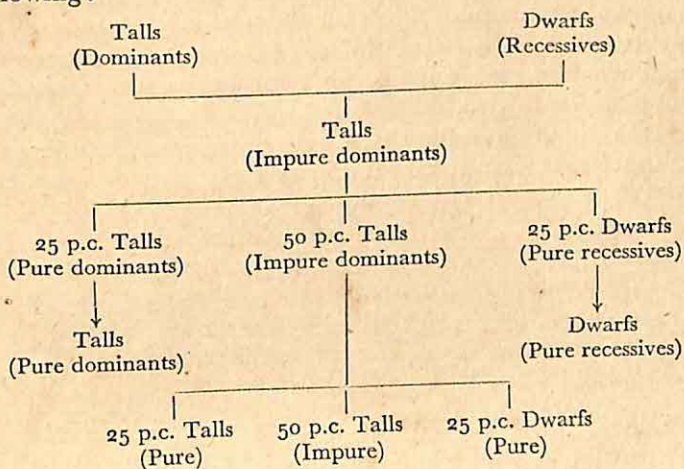
¹ Thomson and Geddes, *Evolution*, p. 116.

lines we should require to explain first why the germ-plasm remains similar. Further, MacBride, while admitting that the doctrine of germinal segregation is true in the case of many small animals with short lives, states that in the vertebrata the germ-cells, after appearing very early in the embryo, subsequently degenerate and are absorbed before the animal grows up. Those germ-cells which actually form the starting-point of offspring are developed later. Weismann's theory, even if substantially true, does not explain heredity. Biology, however, is much indebted to him for the conception of the hereditary relation "not as between the bodies of parent and offspring, but between the parental and the filial germ-cells."¹

We are, perhaps, on safer ground when we examine Mendel's famous law, which throws some light on the conservative tendency in heredity. In 1865 Gregor Johann Mendel, an Austro-Silesian monk, communicated a paper to the Natural History Society of Br \ddot{u} nn, which remained practically unknown until 1900, when other investigators independently reached similar results. Mendel's experiment consisted of crossing giant peas with dwarf peas, and in examining the progeny for several generations. These peas are habitually self-fertilized, a fact which very much simplifies the conditions. Now the peas of the first hybrid generation were all tall: tallness, therefore, was termed the 'dominant' characteristic, dwarfness being called 'recessive.' When the tall or dominants of this hybrid generation were left to self-fertilize they produced, in the next generation, tall and dwarfs in the proportion of three to one. The dwarfs of this generation were allowed to self-fertilize: all their offspring of the next and all subsequent generations were dwarfs. Thus the dwarfs of the second hybrid generation were pure recessives. The tall of the second generation were also allowed to self-fertilize, and their offspring were of two kinds. One-third of them turned out to be pure dominants, producing subsequently nothing but tall: the other two-thirds, since they produced tall and dwarfs in the proportion of three to one, were impure dominants like the whole of the first hybrid generation. Thus

¹ Thomson and Geddes, *Evolution*, p. 138.

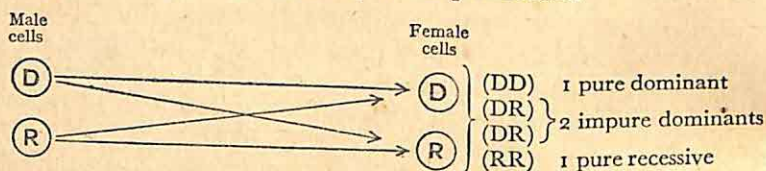
the whole of the second generation consisted of 25 per cent. of pure recessives, 25 per cent. of pure dominants, and 50 per cent. of impure dominants. These apparently complicated results are quite simple when expressed in a table such as the following:



These results, since they became known, have been verified again and again in both plant and animal life, close inbreeding in the case of the latter corresponding to self-fertilization in the former. Some characteristics blend, while others do not: Mendel's law applies only when the parents have contrasted characteristics which do not blend. For example, the law has been proved to hold when normal mice are crossed with waltzing mice, normality being the dominant and waltzing the recessive characteristic.

Mendel himself put forward the hypothesis of the "segregation of pure gametes" to explain these remarkable facts. He supposed that the generative cells, or gametes, produced by the first hybrid generation were of two kinds, either pure dominants or pure recessives, but not mixtures of both; further, that the two kinds were produced in approximately equal numbers, and that subsequent fertilization was fortuitous. Now, remembering that a new individual is produced by the union of

a male with a female cell, we see that a male dominant gamete with a female dominant gamete would give a pure dominant; a male recessive with a female recessive, a pure recessive; a male dominant with a female recessive, an impure dominant; and a male recessive with a female dominant, again an impure dominant. Thus the chance of a pure dominant appearing would be one in four; that of a pure recessive would also be one in four; while that of an impure dominant would be one in two. These deductions from the hypothesis are exactly the results obtained by experiment. Again a diagram¹ may help to clarify the explanation:



This theory has been well called the cornerstone of Mendelism: that the germ-cells produced by hybrids are of the pure parental types, and cannot, in consequence, transmit the opposite character. The offspring may be free from all taint of the cross. We see also that when Mendel's law is being fulfilled we get continual reversion to type in both directions.

In this brief and imperfect study of heredity we seem to have found one or two facts, but the matter remains almost entirely unexplained. Can we fare any better with the notion of evolution?

The doctrine of evolution may be stated in a few words: that the different species of animals have sprung from a common ancestry; that higher forms of life have evolved from lower by a process of gradual and orderly change. As Mr Bernard Shaw puts it:

If you believed that dogs and cats and snakes and birds and beetles and oysters and whales and men and women were all separately designed and made and named in Eden garden at the beginning of things, and have since survived simply by reproducing

¹ Thomson and Geddes, *Evolution*, p. 135.

their kind, then you were not an evolutionist. If you believed, on the contrary, that all the different species are modifications, variations, and elaborations of one primal stock, or even of a few primal stocks, then you were an evolutionist.¹

The bitter controversies over the fact of evolution have now died down, and few would venture to deny the substantial truth of the proposition we have stated. It is indeed the view of the plain man nowadays. Although the doctrine is inseparably associated with the name of Darwin, the probability of some such truth was discerned by Aristotle and other Greek philosophers; while nearer his own day Darwin had several predecessors, such as Goethe, Buffon, Lamarck, and Erasmus Darwin, his own grandfather.

Such a doctrine is obviously of the deepest concern to the psychologist and educationist. Indeed, it may be regarded as the main contribution that biology has to offer to psychology and educational theory. Its far-reaching consequences are now being realized, but it will be many years before they can be fully worked out in practice. Clearly, if evolution applies to man's body it must apply also to his mind. We are certain that the higher mental processes are closely correlated with the activity of the cerebrum, if, indeed, there is not a "one-to-one correspondence" between the two. If we admit that the cerebrum itself is a product of evolution it is difficult to deny the proposition that the mind likewise has evolved from lower forms.

Although the fact of evolution is generally accepted, there is much dispute as to the manner of its taking place. All agree in seeking an explanation in the interaction of the living organism and its environment, but biologists differ in the stress they accord to either factor in the process. Two sharply contrasted views are associated respectively with the names of Lamarck and Darwin; it is therefore permissible to label them Lamarckism and Darwinism, or perhaps better, neo-Darwinism in the case of the latter, since Darwin cannot be held responsible for all the interpretations put on his work by his enthusiastic disciples.

¹ *Back to Methuselah*, p. xix.

Lamarck (1744-1829) was a French naturalist who, according to Haeckel, the great German evolutionist, gave "the first connected and thoroughly logical exposition of the theory of descent." He stressed the part played by the living organism, and offered the apparently easy and natural explanation of evolution that the creature, having an inward urge to realize its needs and to adapt itself to its environment, changes its natural habits and even modifies its bodily structure in order to do so. Such modifications, especially any marked use or disuse of a bodily organ, are handed on to the offspring, who, in turn, make a further advance in the same direction. Thus new species gradually emerge from old.

We may illustrate the Lamarckian doctrine by considering the classical instance of the giraffe. In order to reach the leaves of trees, the original horse-like animal had habitually to stretch its neck, so modifying, however slightly, its bodily structure. The progeny would have somewhat longer necks than their parents, and, the same environmental stimulus persisting, would acquire a further modification in the same direction. They too would hand on the gains to their offspring, and gradually the enormously long neck would be developed. In a word, Lamarck supposed that the environment was such that successive generations felt the need to stretch their necks, and that they passed on their gains to their progeny.

Lamarck's doctrine rests on two main assumptions. The first is just the reality of that inner urge which we have been calling 'horme' in previous chapters. The second is that modifications acquired by the parents during their lifetime are transmitted to the offspring. The latter assumption has given rise to a great controversy which has by no means been finally settled. We shall return to it in a moment.

Darwin (1809-1882) deservedly holds the honour of having made the world "think in terms of evolution." Not only did he demonstrate the fact of evolution in an argument of wonderful clarity and power, but he offered an explanation which influenced the thought of a generation. He was thought in his day to have explained evolution, but this is hardly correct.

He put forward and emphasized one or two essential factors in the process, which, as usually happens with the work of a great man, were overemphasized by his followers to the exclusion of any others. Although Darwinism at the moment tends to be discredited, no discredit need fall on Darwin himself, who was a patient, hard-working, clear-sighted naturalist, the very model of a man of science.

What are the essentials of his doctrine? In contradistinction to Lamarck, Darwin emphasized the action of the environment on the organism. He pointed out that most animals are enormously prolific, that there is neither room nor food for all, and that there is, in consequence, a struggle for existence and a survival of the fittest. But why should one individual be more fitted than another to survive? Darwin answered this question by pointing to the innate variations existing between one individual and another. The web of life is so intricately woven that even the slightest accidental variations may have a survival value for their possessors, who will consequently have longer life and larger families than their less fortunate brethren. These favourable variations are passed on to the next generation, who in turn vary about a new mean: again those most favourably endowed survive, propagate, and transmit the variations to their offspring. Gradually in this way new species would emerge, isolation greatly helping the process. All the characteristics which distinguish one animal from another are attributed, in the last resort, to slight variations in the individuals of some primal stock or stocks.

In the case of the giraffe, for example, we may suppose that the animal at one stage of its development was four feet high. As it multiplied all the foliage within reach of animals of this height would be quickly consumed, and only those taller than the normal would survive. This selection and elimination would persist in countless successive generations, the ultimate result being the giraffe as we know it to-day.

Darwin's theory, then, rests on the assumptions that living creatures are very prolific, that they have to struggle for food, that variations occur and are transmissible, that the result is

the survival of the fit and the elimination of the unfit. Natural selection is the name given to the process, while survival of the fittest more aptly describes the result.

Darwin recognized two kinds of innate variations: firstly, those slight variations that cluster round a mean type, and, secondly, those saltatory variations, or sports, which are a sudden leap away from the normal. He did not assume that the variations were other than accidental, but he recognized quite frankly his profound ignorance of their origin. He believed that both kinds were transmissible, but that it was by the accumulation of the slight variations that new species had arisen.

Others, however, have concentrated on the sudden, discontinuous variations, or mutations, as they are now called. Galton compared organic structure to a polygonal model which might suddenly topple over into a new position of equilibrium. Professor Hugo de Vries, of Amsterdam, published in 1900 *The Mutation Theory*, in which he gave an account of his study of the evening primrose. He found that new types suddenly appeared, and that the progeny of these mutations did not revert to the original. He argued that the raw material of evolution was therefore to be found in these mutations, which, however, he regarded as unpredictable and not due to environmental causes. Professor MacBride, however, sees insuperable objections to this theory. He points out that mutations occur infrequently, and argues that, in any case, since they are due to germ-weakening, they are less adapted for survival than individuals of the normal type. According to him, then, mutations are unpromising material for progressive evolution.

Before attempting to assess the relative values of the rival theories we must briefly examine the question of the transmission of acquired modifications, which, as we have seen, is fundamental to the theory of Lamarck. Acquired modifications must be carefully distinguished from both the small, innate variations and the saltatory mutations which Darwin and de Vries respectively believed to be the material submitted to the winnowing action of natural selection. These

modifications now under discussion are the changes induced during the lifetime of an individual by peculiarities of use or disuse of various organs, by change in surroundings or in nurture. The question is, Are these acquired modifications transmitted? The view of the plain man is, of course, that transmission does take place. He tells us that good-mannered parents have good-mannered children, and will quote numerous instances to prove that good and bad modes of life are heritable. Yet one may make him pause by pointing out that one-armed fathers have two-armed sons, and that therefore one-armedness is an acquired characteristic which is not transmitted. Sir John Adams quotes the saying of the prophet Jeremiah that "the fathers have eaten a sour grape, and the children's teeth are set on edge,"¹ pointing out that here we are not necessarily dealing with cause and effect, and that the setting on edge of the children's teeth may be due to the persistence of the sour grape in their environment. And a little reflection will convince the student that the appearance of the parents' special characteristics in their children may be due, not to heredity, but to their having been brought up in the company of their parents. Such an effect is so like heredity that the term 'social heredity' has been coined to express it. The effects of bodily and social heredity are extremely difficult to disentangle, and an appeal to common experience fails to settle the question of the transmission of acquired characteristics.

The question was vigorously debated, and seemed at one time to be settled. Weismann's decision against transmission was widely accepted by scientists, and was supposed to have given the death-blow to Lamarckism. Certainly it was difficult to see how acquired modifications could affect the germ-plasm if that germ-plasm had been set apart at a very early stage and had taken no part in the development of the body. The question was tried at the bar of experiment, and no evidence that transmission did take place was forthcoming. Weismann's own crucial experiment consisted in cutting off the tails of mice for generations and observing that the young

¹ Jeremiah xxxi, 29.

mice persisted in being born with tails. Having in this way demonstrated that acquired taillessness in mice is not a heritable characteristic, he triumphantly asserted that acquired characteristics could not be transmitted.

Some, however, refused to accept this negative verdict, and the whole question has been reopened. Biologists nowadays are not wholly convinced that acquired modifications do not affect the germ-plasm.

The effects of an often-repeated stimulus may saturate through the organism by nerve paths and protoplasmic bridges and the fluent blood ; what then precludes them, in some cases at least, from reaching even the germ-cells in their recesses ? ¹

Further, Weismann's experiment was childish and silly : it can be as well used to defend as to refute Lamarckism. As Bernard Shaw points out, the mice did not lose their tails, because they did not want to. "A vital conception of evolution," he says, "would have taught Weismann that biological problems are not to be solved by assaults on mice." ²

The most recent chapter in the controversy is the attempt to prove that acquired habits are in some degree transmissible. There can be no doubt that habits acquired early and persisted in throughout life do modify the bodily structure of an individual. To find an example one has only to think of the muscles of the blacksmith. Now the offspring of such individuals, if they are exposed to the same stimulus, acquire the habits more easily than their parents, and the structural alterations are increased. If the stimulus persists from generation to generation the habits and the consequent modifications of structure appear on slighter and slighter provocation : eventually they may appear without any stimulus at all.

Some evidence of the truth of the above proposition is now forthcoming : we shall cite the results of one experiment only. McDougall ³ repeatedly placed pure-bred white rats in a tank of water from which they could escape to a platform by either

¹ Thomson and Geddes, *Evolution*, pp. 195, 196.

² *Back to Methuselah*, p. 1.

³ *British Journal of Psychology*, April 1927 and January 1930.

of two gangways. One or other of the gangways was always brightly illuminated from behind, and so wired that in using it the rat suffered an electric shock through his feet: thus, in order to avoid an unpleasant experience, he had to leave the tank by the dark gangway. McDougall found that initially the rats made, on an average, about 165 errors, receiving therefore the same number of shocks, before learning to go by the dark route. Continuing his experiments with the progeny of the original rats, he found that in the twenty-third generation only 25 errors, on an average, were made before the desirable habit was acquired. Thus the young acquire useful habits more easily than their parents, although it probably takes thousands of generations for such habits, and any structural changes associated with them, to appear independently of the 'lessons.'

We have now reached, by a somewhat circuitous route, a provisional answer to our original question: "How do instincts originate?" Instincts are racial habits which have probably been slowly transmitted in the way indicated above. A certain race of animals would find itself in circumstances in which certain habits would have to be acquired if self- and race-preservation were to be achieved. The same circumstances persisting, their progeny would acquire the useful habit rather more easily. In successive generations the tendency to acquire this habit would become stronger and stronger, and eventually the habit would not have to be learned at all. Further, we must suppose that, behind the habits, certain brain and mental structures would be formed and passed on.

For example, animals in danger would acquire the habit of running away, since this reaction deals most effectively with the situation. Successive generations would more easily acquire the habit, until finally it would not need to be acquired at all. The engram complex determining the action would then develop in the individual independently of his experience, and would constitute an instinct. No doubt such a process must have been extremely slow, for all our instincts relate to the remote past of the race and to uncivilized existence. But it is permissible to hope, especially since man is now taking himself

in hand, that we may one day even have instincts relating to civilized life.

The foregoing discussion on the factors in evolution has clearly many applications to psychology and educational theory. We may note, first of all, its bearing on the philosophy of education. Although Darwin himself, while emphasizing the selective action of the environment, did not altogether neglect the part played by the living organism, his followers utterly failed to preserve any such balance, and soon exalted the principle of the survival of the fittest into a philosophy of life. Certain acute minds of his own day did not fail to see where such an exaggeration would lead. Samuel Butler felt so strongly on the matter that he went the length of attacking the personal character of the great naturalist: with more justice, perhaps, he pointed out that Darwin had "banished mind from the universe." Huxley declared that Darwinism led one to regard "nature as a gladiatorial show." And we, when we remember the recent World War and the events that led up to it, and observe the present throat-cutting competition in industry, need no convincing of the pernicious effects of such a doctrine when it is applied to man himself and made a justification for acquisitiveness and hate. Perhaps the War, more than anything else, has convinced us that survival of the fittest cannot and must not be the supreme principle in life. In any case, we do not act on it, as witness our hospitals and asylums, and our care of the wounded during and after the War.

We are thus in the midst of a healthy revival of the essential Lamarckian doctrine: that the will-to-live is the chief factor in the process; that it is horme itself that has brought about those changes in habit and consequent changes in structure that are the material of evolution. Bergson's *Creative Evolution* is really Lamarckism shorn of its crudities, and stated in a fresh and forceful manner. Further, as we have seen, the difficulties of the alleged non-transmissibility of acquired characteristics seem to be breaking down. Certain biologists, too, are even sceptical about the importance of natural selection. MacBride states, for example, that "pure-line experiments have dealt a deadly blow at the idea that natural selection is the main agent

in causing evolution." ¹ But it is doing Darwin the barest justice to allow that his main principle must have been a tremendously important factor in the process, even if environment is probably "the stimulus rather than the efficient cause" of evolution. Natural selection is not now generally held to have brought about evolution: it occupies rather "the more modest position of simply accelerating, retarding or terminating the process of otherwise determined change." ²

Neo-Darwinism is an impossible creed for the idealist in education. A choice between this and some form of Lamarckism is, for us, one "ultimately between the Herodian and the Magian view and treatment of the child." ³ 'Survival of the fittest' would lead to a policy of selecting only the favoured children and neglecting the others: and even if attempts were made to train the latter to be fit their success would be the failure of others. Educational effort, in a word, would be merely assistance given to Nature in her process of natural selection. But our educational creed and policy are otherwise: we believe that each child born into the world has his own peculiar contribution to make to mankind as a whole, and that it is the main task of education to enable him to make this contribution. Thus we aim at providing opportunities for each individual to find himself, to achieve his own unique personality and individuality: in an oft-used slogan which is perhaps too narrow to express our full meaning, we talk of erecting the ladder "from the gutter to the university," which he who wills may climb. And this is pure Lamarckism.

The root error of the neo-Darwinian philosophy would seem to spring from its failure to recognize man's power of taking himself in hand. To consider only one example, man need not tamely submit to war, folding his hands and saying that, after all, struggle for existence is in the nature of things, and that he cannot fight Nature. He must rather say that human nature can and must rise above such levels. Man is not the slave of his environment; not only can he adapt himself to it, but he can adapt it to himself, and this he has done in thousands

¹ MacBride, *Evolution*, p. 23.

² Thomson and Geddes, *Evolution*, p. 248.

³ *Ibid.*, p. 176.

of ways too obvious to require mention. To speak of education as "adaptation to environment" is only a very partial truth, for any satisfactory educative process will result in increased power, in the individual and in the race, to mould that environment nearer the heart's desire.

The discussion touches educational theory at other points besides the central one of aim. At the beginnings of popular education it was hoped and even believed that education, persisted in for a few generations, would transform human nature into something essentially nobler and finer than it had ever been before. A belief in the transmission of acquired characteristics was implicit in such hopes, and Weismann's decision came as a great blow to educationists and sociologists. Critics of education jeered, and spoke of the educator's wings having been clipped. Education, they said, was futile, for each generation would have to start again at the beginning, not one whit the better for the efforts expended on its parents. Even under this blow, however, educators had the audacity to rear their heads; they were not slow to point out that, if Weismann were correct, then the task of education was all the greater—being nothing less than the saving of each generation from barbarism. Some went even farther, completely turning the tables on the critics. In *Education and the Heredity Spectre* Dr F. H. Hayward was far from lamenting the non-transmission of acquired characteristics; he argued that the educator ought to rejoice that evil habits were not passed on, since he could be sure of starting his work without a balance on the adverse side.

With the question of the transmission of acquired characteristics in its present unsettled state, it would not be wise to say more. If, however, the work of McDougall and others receives substantial corroboration we shall have grounds for hope that the habits of one generation will be more readily acquired by the next, and that the force of inertia which all educators have to overcome will gradually break down. If this is so our responsibility for seeing that the acquired habits are good is all the greater.

Perhaps Dr Hayward and other champions of the Herbartian doctrine that education is all-powerful too optimistically

ignore the hereditary influences which make themselves felt in the intellectual and moral development of any child. In support of their case they rightly point to institutions such as the Barnardo Homes to show what good nurture and education can effect for children of unpromising antecedents. But heredity still steps in, saying, "Thus far shalt thou go and no further." Galton and his followers, taking the opposite view from the Herbartians, preached the importance of heredity. We are presented with unsavoury family histories, industriously investigated on the other side of the Atlantic, which are expected to convince us that all our educational efforts are powerless to alter by one jot or one tittle the destiny that has been decided by heredity. But Nunn points out that both the Herbartians and the Galtonians err in regarding the child as something to be moulded, in the one case by education, in the other by heredity. He urges what is really the Lamarckian view once more, that the principal factor in the process of development is the child himself, and that he can make what use he will of his hereditary endowment and his educational opportunities. Nurture does not determine his development any more than environment determines evolution; as for heredity, that is not a force outside the child himself, for "the organism and its inheritance are, to begin with, one and the same."¹

The most important application of the fact of evolution to educational theory and practice is undoubtedly the doctrine of recapitulation, which may be summarized in the somewhat startling statement that the individual in his own lifetime recapitulates his racial evolution. As MacBride has put it, "It looks as if certain animals passed through the condition of being other animals before they developed into their own true selves."² It is a daring assumption, but it is accepted by all naturalists. Evidence in its favour is rightly regarded as evidence for the fact of evolution; and the fact of recapitulation is one of the main sources of our knowledge of the past history of man.

Recapitulation is the only hypothesis which will explain

¹ Thomson and Geddes, *Evolution*, p. 114.

² *Evolution*, p. 37.

the curious phenomena of development to be found at all levels of animal life. We must suppose, for example, that the frog, at one stage of its racial development, was nothing more than a grown-up tadpole. Now in its development it remembers, as it were, to pass through the tadpole stage on its way to becoming a frog. The animal world is full of similar instances, and we are assured by embryologists that man himself is no exception to this general law of recapitulation, in respect of his physical nature at least. The organism, during the prenatal months, repeats in a blurred and foreshortened way the ascent of man from the lowest forms of life. Professor Stanley Hall, a great authority on the subject of human development, believes that after birth the recapitulation is continued: we shall return to his argument in a following chapter.

Now, since body and mind have evolved together we should expect that, if recapitulation is true in a bodily sense, it should also be true in a mental sense. Remembering our tentative conclusion that it is the tendency to reacquire habits that is transmitted, and that changes of structure are probably secondary to this, we may even believe that mental recapitulation may be more important than bodily recapitulation. There is much evidence that in his mental development the child recapitulates some of the history of his ancestors. The fact of the gradual ripening of instincts and the truth underlying James's "law of transitoriness"¹ are almost certainly to be explained by recapitulation. Stanley Hall bases his monumental *Adolescence* on this principle of parallelism between racial and individual development. Others have noted parallels between the mental life of children and that of savages in their fondness for toys, their liking for bright colours and personal adornment, their drawings, and generally in their emotional life. Such parallels, of course, do not prove anything, but they are suggestive, and they corroborate the belief in recapitulation which has its foundations elsewhere. We can, indeed, believe with Herbert Spencer that "the mind, like the body, has a predetermined course of

¹ See p. 70.

evolution," a course which, in broad outline at least, is determined by the past history of the race.

Such a doctrine, if true, must be of profound importance in education. Many have stated and sought to apply the dictum that the child must learn as the race has learned. Goethe gave it perhaps its first explicit statement when he said, "Although the world in general advances, the youth must always start again from the beginning and as an individual traverse the epochs of the world's culture." Hegel supported the position thus: "In the progress of the school-room we may recognize the course of the education of the world, drawn, as it were, in shadowy outline"; while one of the famous educational maxims of Herbert Spencer was that "the education of the child must accord both in mode and arrangement with the education of mankind considered historically." Clearly these philosophers and educationists believed that such a doctrine was a fundamental principle of education. As Plato, in order to discover the nature of justice, had to construct a state in which he hoped to find individual justice "writ large," so many educationists hope, in the broad sweep of history, to find "writ large" the development of the individual.

Ziller, a pupil and disciple of Herbart, gave the doctrine its first explicit application to educational practice in his "culture-epoch" scheme; and it was owing chiefly to his somewhat narrow and circumscribed interpretation that the doctrine for a while fell into disrepute. Criticisms of recapitulation in education are many; but it seems to the present writer that they are levelled at foolish and unimaginative applications of the principle rather than at the principle itself, which stands on solid rock. With the advent of modern psychology, indeed, and with the careful scrutiny of and reflection on teaching method so characteristic of modern pedagogy, the doctrine has emphatically reasserted itself, and bids fair to become generally accepted as a cardinal principle of education.

Mr Benchara Branford, for example, a firm believer in recapitulation, is not so much concerned to deduce it from philosophical, psychological, or biological principles as to

argue that the doctrine must stand or fall by the way it works in practice. He asks teachers to observe that the best methods of teaching are, as a matter of fact, echoes of the ways in which the race learned; thus regarding parallelism as no doctrinaire theory, but as a broad and fair summary of teaching experience itself. He indicates many applications to the teaching of mathematics, and states his belief that, "whether or not parallelism is a literal incontrovertible fact, it is demonstrable that the most effective presentations of mathematics are those which follow the historical evolution."

While the principle applies to education in its widest and most comprehensive sense, it is perhaps in the teaching of various subjects that it finds its detailed applications. Thus a study of literature might well begin with fairy-tales, myths, and legends, going on through tales of adventure to the study of poetry and philosophical literature: similarly, a scheme for teaching musical appreciation would most properly be based on the recapitulative principle. A broad acceptance of the principle is really implied in Armstrong's heuristic method of teaching science—that method by which the child is put in the position of the discoverer and allowed to find out things for himself. In mathematics the principle has far-reaching applications both to schemes of work and to individual topics.¹ One example must suffice. In 1923 appeared the Mathematical Association's report, *The Teaching of Geometry in Schools*, a compilation of valuable suggestions from teachers of learning and experience. One of its main recommendations is that the teaching of school geometry should be divided into three stages: (i) experimental, (ii) deductive, (iii) logical. Little is said about history in this report, and the above conclusion is a summary of collective experience rather than the working out of a theory. But although this is the case, the stages can equally well be deduced from the history of the subject, corresponding as they do to (i) the Egyptian stage, (ii) the stage of Thales and the early Greeks, and (iii) the stage of Euclid and the great Greek geometers.

¹ See Nunn, *The Teaching of Algebra*, and B. Branford, *A Study of Mathematical Education*.

We must leave to the reader the task of working out the principle in detail with regard to the subject in which he is most interested, and of comparing the results of such a study with his own experience of teaching. He will do well to remember that in racial learning there were many blind alleys, and to reserve the liberty of idealizing the course of history where he thinks fit. He must make broad applications, realizing that common sense and the fruits of experience are not to be surrendered to any theory, however plausible. Even if the suggestion implied in the doctrine does nothing more than send him to the history of his subject, it will have achieved something of great value. But the teacher will probably find that the history of racial learning will confirm his best methods of inducing the individual to learn, and also suggest to him new and fruitful methods of exposition. ✓

SUGGESTIONS FOR FURTHER READING

THOMSON and GEDDES : *Evolution*.

MACBRIDE : *Evolution*.

SANDIFORD : *Educational Psychology*, chapter i.

SHAW : *Back to Methuselah*.

DARWIN : *Origin of Species*.

BUTLER : *Life and Habit*; *Unconscious Memory*.

BERGSON : *Creative Evolution*.

ADAMS : *The Evolution of Educational Theory*, chapter ii.

HAYWARD : *Education and the Heredity Spectre*.

NUNN : *Education : its Data and First Principles*, chapter ix.

HALL : *Adolescence*.

BRANFORD : *A Study of Mathematical Education*.

PATRICK : *The World and its Meaning*, chapter viii.

CHAPTER VI

BROAD FEATURES OF HUMAN BEHAVIOUR

IN addition to the instincts we have to recognize and study certain innate tendencies of the human mind that are of a general rather than a specific character. They can hardly be called instincts, since they are not dispositions determining a particular mode of action in a particular situation, but are rather seen to be general modes of behaviour in which various instincts manifest themselves. Such general innate tendencies are sympathy, suggestion, imitation, play, and habit or routine. The first three we shall leave for consideration in a future chapter; here we shall concern ourselves with the tendency to repeat the familiar and the tendency to play, both of great importance in education.

Professor Sir T. Percy Nunn points out that the activities of man generally assume either a conservative or a creative form, and that the routine tendency is the typical manifestation of the former. We all tend to do things apparently for no other reason than that we have done them before, and that they are familiar to us. McDougall talks of "the tendency for every process to be repeated more readily in virtue of its previous occurrence and in proportion to the frequency of its previous repetitions";¹ while one of Spearman's principles of cognition is that "the occurrence of any cognitive event produces a tendency for it to occur afterwards."² This tendency, which makes generally for inertia, is far from being a wholly regrettable characteristic of human nature, although, like any other, it may get out of gear and fail to preserve its proper place in our mental economy. It operates in the hundreds of actions we perform every day without troubling to think, such as waking, sleeping, dressing, eating, much of our work, and

¹ *An Introduction to Social Psychology*, pp. 115, 116.

² *The Nature of 'Intelligence' and the Principles of Cognition*, p. 132.

other occupations. Our power to do such things by routine sets our minds free to deal with higher matters.

The tendency to repeat would seem to be one of the most fundamental characteristics of life. Our very bodies are rhythmical in their action, as in the beating of the heart and breathing; and our joy in rhythmical activities is as old as life itself. It is, as Stanley Hall says, "as if the waves of the primeval sea whence we came still beat in them."¹ We rejoice in dancing, and our pleasure in it is due to the same fundamental cause whether the rhythm be crude and unrefined or sublimated into forms of the highest art, as in the Russian Ballet. Similarly, rhythm is at the root of all music, from the beating of barbaric tom-toms, where music and rhythm are one, to the gloriously exhilarating Scherzo in the *Ninth Symphony*. And any merit that the decadent jazz may possess is due to its often quite superb rhythm.

Since the tendency is so deeply rooted in us, it is not surprising to find it strikingly manifested in young children. One has only to watch a young child at play to see endless repetition of the same action. A jig-saw puzzle will be put together again and again; a toy train will repeat the same journey until its unwearied owner is taken to bed; and a little tune mastered on the piano will be played until grown-up people are thoroughly tired of it. Everything in the child's life has to be done in the manner to which he is accustomed, and friction is most easily avoided if novelties are sparingly introduced. It is sheer love of repetition that constitutes the attraction of those ancient games accompanied by songs such as "Here we go gathering nuts in May"; and of those meaningless jargons, no doubt very ancient too, that are employed to count out the company in order to solve the knotty problem of who is to hide and who is to seek. And one secret of the popularity of certain stories with children is the repetition they contain. The classical instance is, of course, the story of Goldilocks and the three bears, where all the situations, actions, speeches, and articles of furniture are repeated three times: and this famous narrative must not be related in synoptic form if the approval of a child audience is

¹ *Adolescence*, vol. i, p. 211.

to be gained. Kipling has recognized the principle of repetition with conspicuous success in his *Just So Stories*, where he does not scruple to repeat situations and forms of words exactly. "The great, grey-green, greasy Limpopo river, all set about with fever trees," is indeed just a chorus, like the chorus of a ballad, in which the audience is permitted and encouraged to join; and a group of children to whom "The Elephant's Child" is read will always chant this wonderful refrain when it comes along.

Now the psychological explanation of the attraction of repetition is the same in all cases: it is just the joy of mastery. In the stories and ballads the audience, whether of children or grown-ups, likes to take part, which the provision of repetition or chorus enables it to do. In psychological language we say that the instinct of self-assertion is at work. Repetition is the easiest channel of self-assertion, and positive self-feeling is engendered when something familiar occurs. No doubt the highest forms of self-assertion are found in creative work, but the average person is content to plod along, asserting himself over his environment by doing again what he has done in the past. We all know the tiresome person who has an apt proverb to deal with any situation that arises, whose *cliché* prevents him from being overwhelmed though the heavens fall. And the young child, since his mental and physical powers are limited, naturally achieves much of his self-assertion in repeating the familiar. Our innate tendency to repetition, then, has been fostered in the interests of the self-assertive instinct.

The connexion between the two, however, is rather more complex than this, for the one reacts on the other. It is true that when we desire self-assertion we tend to repeat the familiar, but in so doing we improve our powers by practice: the activity that is repeated then becomes a better channel of self-assertion and paves the way to a fuller self-realization. For example, one would rather play a familiar game than a new one, since positive self-feeling is more likely to be found in the former; but the practice so obtained improves our playing of that game, which in consequence becomes a better means than ever of expressing an important part of ourselves. The reason

for our strong conservatism in such matters would seem to be the power of repetition to improve the channel of self-assertion, which self-assertion originally started.

An instance noted by the writer may bring out the point. A boy of fifteen months old, when put to bed, would lie awake repeating his rapidly increasing vocabulary one word after another. The desire for positive self-feeling no doubt impelled him to repeat what he could already perform, but the repetition constituted practice, and the gains of each day were consolidated. This particular channel of self-assertion eventually became so important to the boy that throughout his childhood his linguistic powers, both oral and written, were remarkable.

Thus repetition need not be a means of intellectual stagnation in children. Providing at first a ready means of self-assertion, it results in the formation and consolidation of engram-complexes which are, in turn, the basis of still more successful self-assertion. This being so, the tendency must not be neglected by the educator who wishes to follow in Nature's ways.

It is in this routine tendency that the teacher finds his charter for the drill which experience has taught him to be needful in effective teaching. We all know well that the path of learning cannot always be easy and full of novelty, and we rightly look askance at any psychological doctrine which condemns necessary repetition. It is not long since teachers who valued their reputation for being up to date in their methods made serious attempts to eliminate repetition on the grounds that it constituted drudgery for the child: many, however, found that the results failed to justify such an interpretation of the doctrine of interest. It is satisfactory to know that we are, after all, basing our teaching method on sound psychology when we require tables, formulæ, and conjugations to be learned by rote, and even allow them to be chanted in chorus in the good old-fashioned way. We must, however, bear in mind the fact that such learning is not to be regarded as an end in itself, but only as a consolidation, by Nature's own method, of a basis for future creative work. Further, the memorizing must be intelligent: tables, for example, must be constructed by the

children themselves before they are committed to memory, and the learning of a formula must be the end of a reasoning process, not the start.

One need not enumerate examples of teaching where the repetition tendency may be used, for every teacher who has tried to pilot a class through a syllabus knows them well enough. Let one suffice. There is no method of obtaining speed and accuracy in arithmetic except continual drill in its various operations. Dr Ballard, in his recent delightful book,¹ professes himself old-fashioned enough to believe that, however 'intelligent' the working of a sum may be, it is useless unless the answer is correct: and here certainly he will get most people to agree with him. The teacher of arithmetic, then, should drill his pupils until they get right answers automatically; in doing so he will find that success in mechanical sums is sufficient achievement in self-assertion to justify their drudgery from the point of view of the pupil. It is a mistake to suppose that ordinary arithmetic need be continually disguised in 'interesting' problems about apples, oranges, or elephants.

Further, the routine tendency affords ample justification for order in school, if such justification is necessary, as perhaps it is in these days of doctrines of 'self-expression.' Every practical teacher knows how much time and energy are saved by having a settled procedure; and psychology tells him that his desire for having things done decently and in order is in accordance with child-nature. Children themselves much prefer order to disorder, and regard it as no hardship to be required to do things in a relatively stereotyped fashion and as a matter of course.

We may find here, if we care, an argument for that bug-bear of the modernist in education, the time-table. Such a time-honoured institution has its justification in the conservative side of child-nature and cannot therefore be wholly bad. A time-table must not, of course, be allowed to cramp creative and original work: the wise teacher will regard it as his servant, not his master.

The main secret of effective discipline in school and class lies

¹ *Teaching the Essentials of Arithmetic.*

in the establishment and maintenance of a good routine. As Professor Nunn has expressed it,

The routine tendency should be allowed to act in school, as in the wider social community, like the fly-wheel whose momentum keeps a machine in orderly motion, overcomes obstacles, and carries it past the 'dead-points,' where the prime motive forces cease for an instant to act.¹

In our brief study of routine we have seen the conservative tendencies at work, and have drawn certain educational conclusions. Such conclusions, from their very nature, are cautious and conservative in character, and require supplementing by a consideration of the creative tendencies, which are manifested so clearly in play.² We shall not yet attempt a definition of play, but proceed with the discussion, assuming that the reader knows what we are talking about. We may say in passing, however, that play is no simple phenomenon, and that it is not always easy to distinguish it from work. Our discussion may help to clarify these points.

Various attempts, all interesting and important, have been made to supply an explanation of the native tendency to play. The German poet Schiller, and later the engineer-philosopher Herbert Spencer, argued that play was the expression of a surplus of energy. The young creature, being fed and defended by its parents, has more energy than it needs for maintenance and growth, and it expends the surplus in play. Now this may be true up to a point, but it is a hopelessly inadequate explanation of the phenomenon. For one thing, it does not explain why play takes definite forms instead of being a mere formless discharge of energy; for another, it fails to explain why we play when we are tired. Again, as Professor Nunn has pointed out in an admirable illustration,³ while we can imagine the surplus steam of an engine being turned to good account in various ingenious ways, we cannot imagine it being used to make the engine itself a better engine: but this is exactly what play does for the growing individual, enabling him to find his own powers, physical, mental, and moral. We shall see, however,

¹ *Education: its Data and First Principles*, p. 70.

² *Ibid.*, p. 80.

³ *Ibid.*, pp. 80, 81.

that if we think of the surplus energy as psychical rather than physical the theory can be restated in a more convincing way.

Of great educational importance is the practice theory of play, first suggested by Malebranche, and later developed and defended by Karl Groos in his two works, *The Play of Animals* and *The Play of Man*. Considering first the less complex phenomenon of play in the animal world, he notes that it is the higher, not the lower animals that play. Higher animals, such as the cat and dog, are helpless when born, and have a period of immaturity during which they are dependent on their parents for protection and the provision of the necessities of life: this period they utilize for play. Lower animals, on the other hand, such as the ant and the bee, are from the start perfectly adapted to their surroundings; they fend for themselves straightaway, and spend no time whatever in frivolity. Groos notes further that the form of play in the higher animals anticipates the serious activities of their adult lives: thus the kitten in its play chases any moving object, so perfecting itself in the art of catching mice. The puppy, too, plays at fighting, so practising an art that will stand it in good stead later on. He concludes that the essence of play is its biological utility; he sees in it the exercise of instincts before they are needed for serious use, such exercise leading to the skill that will be necessary in the future. Play is teleological, always anticipating the future needs of the animal.

Such a theory is highly plausible. Groos seems to be correct in viewing helplessness at birth, a period of immaturity, and the impulse to play as different aspects of a single phenomenon. His argument is strengthened by the additional consideration that the higher the position in the scale of intelligence to which the animal ultimately rises, the longer is the period of immaturity accorded by Nature, and the more pronounced is the impulse to play. Now we have seen that intelligence depends on the degree to which the instincts are plastic: those animals, such as the bee, that are born with stereotyped modes of reaction in virtue of which they are perfectly adapted to their environment throughout life, behave on an instinctive rather than an intelligent level. But the plastic instincts, which are the

raw material of intelligent behaviour, need a period of adaptation in the life of each individual, and such a period is provided during the months or years of immaturity. That is to say, it is those animals which, by reason of the high level of intelligence they are destined to reach, are helpless at birth and therefore require education that have an impulse to play and are provided with a period of life in which to exercise that impulse. We are asked, then, to conclude—and it seems difficult to resist such a conclusion—that play is Nature's mode of education, in the sense of adaptation to environment. The need for education consists in helplessness at birth, the possibility of it arises from the plasticity of instincts, the time given for it is the period of immaturity, the method of it is play; and all of these are concomitant phenomena in the animal world.

How far can the theory be applied to the play of man? Is his play biologically useful in preparing him for the serious business of manhood? It can certainly be maintained that a boy playing at soldiers and a girl nursing a doll may both be preparing for serious adult activities. No doubt the theory loses its beautiful simplicity when applied to the multifarious forms of children's play; but Groos argues that these many forms are themselves anticipatory of the complexity of activities in which man engages, and that in his play the boy is unconsciously 'trying out' various possible occupations of manhood.

One may feel that Professor Stanley Hall is being unduly severe when he describes this striking and ingenious argument as "very partial, superficial, and perverse," since "it ignores the past where lie the keys to all play activities."¹ But doubtless there is much in his objection. According to him, the child is not so much rehearsing the serious activities of his own adult life as harking back to and recapitulating those of his remote ancestors. Play is reminiscent rather than anticipatory, exercising

many atavistic and rudimentary functions, a number of which will abort before maturity, but which live themselves out in play like the tadpole's tail, that must be both developed and used as a stimulus to the growth of legs which will otherwise never mature.¹

¹ *Adolescence*, p. 202.

Now we can cite many instances of play which readily fall under a general theory of reminiscence. Clearly the play of the kitten and the puppy can be explained by this theory as readily as by that of biological utility. Hide-and-seek, chasing, hunting and fishing, stone-throwing, the building of houses and shelters, especially in trees, the fascination of caves, all remind us strongly of the youth of the race. It is because of reminiscence, says Stanley Hall, that "the heart of youth goes out into play as into nothing else, as if in it man remembered a lost paradise."¹ And since, according to the same authority, the whole of development consists in a recapitulation of racial history, we can believe readily enough that in our play we recapitulate certain activities of primitive man.

Not unconnected with the theory of reminiscence, but worthy of special explanation and emphasis, is what we may call the cathartic theory of play. 'Catharsis,' a word taken from the writings of Aristotle, seems to have been originally a medical term, meaning a 'purge.'² The great philosopher used it to describe the effect of tragedy, teaching that, as medicine purges the body, so tragedy purges the soul. When we witness the enactment of a tragedy our pent-up emotions are relieved; we project ourselves into the part of the hero, experience to some extent the feelings he portrays, and go through the emotional conflict with him to the end. And since in all true tragedy this conflict is resolved, the spectator has his emotions purified and elevated by the spectacle. Now this purgative or cathartic action is by no means confined to tragedy: it applies equally well to a good farce. If we ask why we enjoy the antics of a knockabout comedian who smashes crockery, trips up policemen, and generally plays the fool, we are bound to answer that it is because we like to see others do the things that we are too well-behaved to do ourselves. Civilized behaviour is rather a strain at times, and kicking over the traces at second hand, or by projection, is better than never kicking them over at all. In farce, as in tragedy, by projecting ourselves into the hero, and experiencing with him the more

¹ *Adolescence*, p. 203.

² See Burnet, *Aristotle on Education*, pp. 124, 125.

or less violent emotions he portrays, we relieve our pent-up feelings.

Does this doctrine of catharsis help us to understand play? It seems to the present writer that such a notion constitutes the most comprehensive formula yet offered. Play is cathartic in its action; that is to say, it provides an outlet for certain pent-up instincts and emotions which, whether in childhood or in adult life, cannot find sufficient direct expression. In civilized life the instinct of pugnacity, for example, finds insufficient scope for exercise. By nature we are fighters, and fight we must, so the civilized man fights in play. Every game is a sham fight, in which no blood is shed, or even anger displayed, but which nevertheless relieves the energy of this instinct, providing a vicarious channel for its expression. To say that play is a means of discharging surplus energy would seem to be true if, agreeing with Hall that "play has as much soul as body,"¹ we mean by 'energy' that psychic energy of which the instincts are the fountainheads. This same notion of catharsis, or purging of emotions by vicarious forms of expression, readily explains the phenomenon of make-believe play, as we shall see in a moment.

In spite of Hall's condemnation of Groos, we must see that the various theories are complementary rather than contradictory. We have just indicated a means of reconciling the theory of surplus energy with that of catharsis. Further, the latter may be regarded as an extension of the theory of reminiscence, for the emotions that are purged in play are just those primary emotions inseparably connected with the instincts, which, as we have seen, are dispositions to certain activities inherited from our ancestors. Reminiscent play is a means of discharging the energy of these instincts in a harmless, nay, in a profitable fashion. For such purging of emotions that would otherwise tend to be repressed is clearly of biological utility, preparing us for a civilized form of adult life, and helping to keep us civilized when we are grown up. Thus, in the notion of useful catharsis, we approach a reconciliation between the forward look of Groos and the backward look of Hall. And we may point out, too, that both may well be correct if the adult

¹ *Adolescence*, p. 203.

activities in question are simple and ancient modes of life. While Hall is probably sound in his contention that "true play never practises what is phyletically new,"¹ we can see that it may practise what is not racially new. The play of children may, at one and the same time, be the recapitulation of ancestral activities and the anticipation of the adult activities of the individual himself, provided that the latter are what the race has done for countless generations. We see this clearly when civilization relapses into barbarism, as it did in 1914. No doubt the men who, in their boyhood, had played hide-and-seek, constructed shelters, and thrown stones, received the impulse to do such things from their ancestors; but at the same time it was play of this kind that later produced skill in the arts of trench-warfare and bombing.

All the theories are required to give a comprehensive account of a very complex phenomenon, and to explain among them the various forms of play. It is well worthy of note that the theories of biological utility, reminiscence, and catharsis agree in seeing the instincts at work in play. The theory of a surplus of physical energy is most inadequate in its neglect of the instincts as springs of psychic energy. As already mentioned, it signally fails to explain why we play when we are tired, and yet this is one of the most curious and interesting aspects of the play activity. A business-man, for example, on returning home may easily be too tired to lay a carpet, and yet find energy to play a game of golf or go fishing. Where does this energy come from? The explanation probably lies in the fact that the golf and the fishing are sustained by instinctive energy, in the one case from the combative instinct, in the other from the food-seeking instinct; while the laying of carpets has no such dynamic behind it. Instincts may be regarded as stores of psychic energy that can be tapped when the energy derived from less well-established sources is on the point of failure. But any further attempt to explain this would involve the psychophysical problem, which we decided earlier to leave on one side.²

¹ *Adolescence*, p. 202.

² See Nunn, *Education: its Data and First Principles*, p. 73, and McDougall, *An Outline of Abnormal Psychology*, pp. 58 et seq.

The proposition that play is Nature's mode of education, which is a summary of Groos' argument, is confirmed by the other theories, and may be taken as a working hypothesis by the educator. For education must always have a backward look, seeking to conserve the best of man's past; and Hall teaches us that play is Nature's means of doing so. Again, one of the main tasks of education is the sublimation and redirection of instinctive energy; this, according to the cathartic theory, is the effect of play. Thus the educator who would proceed 'according to nature' ignores play at the risk of stultifying his efforts.

One of the most interesting and important forms of play is make-believe. All children in their play assume various rôles and enact them with remarkable concentration and fidelity to real life, becoming engine-drivers, milkmen, tram-conductors, coalheavers, teachers, as their fancy takes them. Now it would be a very superficial explanation of this feature of child-behaviour to say that it is due to imitation. No doubt the imitative impulse is at work, but it supplies only the material and the setting of the play. Groos, as we have seen, explains make-believe play as an unconscious preparation for adult life—as an experimenting with life; but perhaps a more satisfying and convincing explanation can be found on the lines of the cathartic theory. The child, in his usual surroundings, does not find sufficient scope for all his instincts, notably his instinct of self-assertion: his environment, physical and social, is rather too much for his limited powers, and he cannot dominate it as he desires. In his make-believe play he finds a channel for the relief of the pent-up energy of this instinct. As an imaginary tram-conductor or teacher he achieves the positive self-feeling for which his prosaic environment gives him insufficient opportunity. In all make-believe play, then, we must look for a discharge of instinctive energy that would otherwise be bottled up.

A very interesting aspect of the phenomenon of make-believe is the creation by the child of an *alter ego* and other imaginary companions. Most children, at one stage of their development, live in a world of fantasy peopled by creatures

of their own making. A child well known to the writer began talking at the age of three or four of his own little boy, a being who had the most extraordinary adventures and who could be incredibly naughty on occasion. He would run across the street in front of fast-moving buses and escape unharmed, he lived near a station where he could see trains all day, and he eventually acquired a father and a mother who indulged him on every possible occasion. This is only the merest sketch of an example of a curious but almost universal phenomenon of child-life. Clearly the imaginary companion is the child himself over again: the *alter ego* has been formed in his own image, and on him are fastened the child's own unfulfilled desires. The form he takes and the actions he performs are the complement to the actual circumstances of his creator; his boldness, good fortune, and naughtiness must be regarded as compensations for the timidity, dullness, and good behaviour of the child himself. Thus the creation of an imaginary companion who plays so successfully on the stage of life has a cathartic effect on the child's emotions: pent-up emotional energy is discharged at second hand. Further, this projection of himself into an imaginary being must be a powerful factor in the child's becoming conscious of himself as an agent who thinks, feels, and acts.

No student of child-psychology can afford to neglect any opportunity of making a first-hand study of child-fantasy, which affords so valuable an index to the emotional life of the child and indicates so clearly his unfulfilled desires. Modern literature contains many examples of such studies put in a delightful form. Peter Pan, for example, lives the life of superb adventure that is an unfulfilled desire of the normal boy, and the secret of his universal appeal lies here. He is able to fly, to hold converse with fairies, to be on terms of intimacy with Red Indians, to cope successfully with pirates, and to dominate his companions. Moreover, he never grows up, and therefore never has to leave this delightful world. Here we have the reason for the affection in which he is held by grown-up people: we all feel, deep down in our hearts, that we have left a paradise of childhood, and the spectacle of

Peter helps us to return to it, if only for an hour. In *The Little White Bird* Barrie gives us the story of Peter in its true setting: it is a saga spun in fantasy by a little boy, David, under the kindly encouragement of a friendly old bachelor whom he habitually meets in Kensington Gardens. This creation is surely a masterpiece in child-psychology, and its universal popularity is a measure of its truth. Second to it, perhaps, are Mr A. A. Milne's stories of Christopher Robin and Winnie-the-Pooh. That excellent teddy-bear was not very bright intellectually, but he had a heart of gold, cheerfully playing second fiddle to Christopher Robin, always admitting his intellectual superiority, and consoling him in trouble.

Such writers have set out deliberately to portray the child in literature: in our wealth of fairy-tales, however, we have him portrayed, spontaneously and unconsciously. Fairy-tales may be regarded as ready-made child-fantasies which the child remakes rather than makes—imaginary worlds that are provided for him rather than constructed by himself. And we may confidently assume that it is on account of their entire suitability to the emotional needs of the average child that certain tales have survived from generation to generation. Many of them are the same story in different settings. On the one hand we have young persons such as Cinderella, Hop-o'-my-thumb, Jack the Giant-killer, the Ugly Duckling, the Babes in the Wood; on the other we have massed forces of cruel stepmothers, powerful giants, wicked uncles, and malevolent witches. The plot usually consists in the persecution of the former by the latter, and the subsequent turning of the tables with the help of a fairy godmother or other supernatural being.

Now such stories, however fantastic and unreal, are admirable settings into which the child can project himself, his emotional life, and his domestic situations. He identifies himself, of course, with the hero, following his adventures with breathless interest because he himself is the hero for the time being. He feels, subconsciously perhaps, that in real life he himself is persecuted, being put to bed, kept out of sight on important occasions, and set to perform disagreeable tasks;

and in the tale he finds a situation which in all essentials is his own situation. He identifies the persecutors of the hero with those who discipline him and thwart his desires; and the triumph of the hero is the counterpart of his own desire to assert himself. Thus his own instincts find catharsis when he projects himself into the masterful hero of the tale.

An interesting character in many fairy-tales is the wicked stepmother. She must be considered in connexion with the beneficent fairy-godmother who comes along as a *dea ex machina* to put matters right for the hero. Both are counterparts of the mother in real life, the former in her sterner character of one who has to discipline the child, the latter in her fonder aspect of one who, in his earliest days, ran invariably to his assistance and denied him nothing. The part played by the fairy-godmother represents the child's desire that his mother's fondness will triumph over her apparent hardness.

One must not suppose that the child consciously identifies himself with the hero, saying, "That is my situation, and this is how I should like to deal with it." The tales are, in any case, grotesque exaggerations of the child's real situation, but this need not blind us to their essential fitness. The child has not yet developed the power of subtle analysis, and a broad caricature will make more appeal to him than a sober statement of probability. He feels rather than knows that the tale is about himself. Nor need we suppose that the makers of such tales wrote them as riders on propositions in child-psychology; their understanding of child-nature was probably more intuitive than intellectual. No doubt a sifting process has gone on: the tales which have come down to us have had a survival value on account of their fitness, while many not so good have been forgotten.

In connexion with make-believe play, imaginary companions, and fairy-tales a curious attitude of the child has often been noted. (While he revels in such products of the imagination, he is frequently uncompromising in his demand for exact truth.) Why should this be so? We cannot suppose that the child finds the distinction between fact and fancy ready made. Our perceptions of what we are pleased to call

facts and the figments of our imaginations are alike mental events; and it is only by experience and by the confirming of one sense by another that we are eventually able to infer that behind the facts there is an external world, while behind the fancies there is no such world. When the child has begun to grasp this distinction he frequently asks of a story, "Is it true?" but the experienced story-teller knows that he is equally well satisfied to listen either to a true tale or to a fairy-story. The question is probably to be interpreted as, "Into which world am I to fit this story, the world of fact or the world of fancy?" When he gets his answer he switches on the relevant set of ideas, applying the standard of rigorous truth only to the 'true' story.

In a similar fashion he learns to keep apart the two worlds of reality and fantasy in his own life. When incongruities come along he will frequently solve the clash of ideas by an ingenious 'fib.' Thus the small boy already mentioned, when asked whether he had ever seen one of his creatures, in an unguarded moment replied in the negative. His questioner, pursuing his advantage, asked, "Then how do you know what he does?" The child, however, triumphantly closed the discussion by replying glibly, "Because I had a letter from him, and I have torn it up."

We did not, at the beginning of our discussion, attempt to define play or to distinguish it from work: such a definition and a distinction are indeed somewhat difficult. No doubt we may say that work is something we have to do, while play is something that we can do if we like; that work is activity pursued for an end beyond itself, while play has no such end. Yet such statements do not get to the root of the matter. The enthusiastic teacher, for example, pursues his work for its own sake, finding in it the realization of his highest self. We might say that his work is like play, were not such a statement liable to be misinterpreted by the critics of the teaching profession. On the other hand, for the boy at a public school who is driven from his hobby to compulsory games play is remarkably like work. The truth of the matter is that the distinction lies not in the activities themselves, but in the attitude of the

doer toward them. If we perform any activity joyfully and of our own accord, with a minimum of external compulsion and restraint, and if in such activity our instincts, either in a crude or a sublimated form, are finding their satisfaction, then that activity is play to us, whatever it may be called by other people. If, on the other hand, there is neither joy nor spontaneity, if our whole heart and soul are not in what we are doing, then the spirit of play is absent and the activity must be called work. Play, then, is joyful, spontaneous, creative activity, in which man finds his fullest self-expression.

Such a definition disposes at once of any idea that play is something frivolous and childish that must be put away when we become men. It is not so much that we play when we are young as that we remain young so long as we can play. Indeed, as Stanley Hall declares, "the best possible characterization of old age is the absence of the soul and body of play."¹ Man's highest achievements have been reached in the spirit of play, and it is no accident that in many languages the word 'play' is applied to music and the drama. Such a use confirms the broad idea of play which we have sought to emphasize: indeed, a good 'play' on the stage is just one into which both actors and spectators can project themselves, and, in so doing, find as complete a means of self-expression and catharsis as the child finds in his make-believe play. In literature, painting, music, and science man has pursued this spirit of joyful, spontaneous, creative play, and has produced, as a result, masterpieces of beauty and truth.

Bearing in mind, then, the comprehensive meaning which we are entitled to give to the word, we need not be startled by the statement that the whole of education should be conducted in the spirit of play. Such a doctrine will not lead to 'soft pedagogics,' but to hard and strenuous, albeit joyful, spontaneous, and expressive activity. "The play-way,"² indeed, is one of the best of the formulæ which attempt to sum up in a word the modern spirit in education. For many years thoughtful educators have been seeking a universal method of education, one that would apply to all children and all

¹ *Adolescence*, p. 206.

² First used by Mr Caldwell Cook.

subjects; the results of their labours are to be found in such doctrines, methods, and plans as the doctrine of recapitulation, the heuristic method, correlation and concentration of studies, the project method, the Montessori method, and the Dalton plan. Sir John Adams set himself the task of extracting the highest common factor of all such manifestations of the new spirit, and discovered it to be the 'paidocentric' tendency—that is to say, the tendency to view the whole process of education from the point of view of the child himself. But this may, perhaps more simply, be called the play-way, since the spirit of childhood is just the spirit of play. The conception of play as joyous, spontaneous activity—the satisfaction, redirection, and sublimation of instincts—can then be said to dominate and include all the workings of the new spirit in education. And the disappointing results so far achieved can be attributed to the blindness of educators who, seeing in play nothing but frivolity, failed to exploit the energy of instincts so abundantly poured forth in this channel.

Any adequate account of the play-way in education would occupy much more space than is at our disposal; fortunately, however, there is no need to attempt a task which has been performed with conspicuous success by others. It must suffice here to make a few remarks of a general character.

In all good schools nowadays some measure of self-government is adopted, prefect systems and house and team systems being the order of the day; and nowhere does one hear reports of failure when such experiments have been wholeheartedly and conscientiously made. The young teacher should take warning that in such matters half-measures are useless; self-government is incompatible with the old authoritarian system, and any attempt to run the two methods side by side is to invite failure. Prefects must be freely elected and given real authority and responsibility: they must never be mere creatures of the master himself. The play-way in school-government may be summed up in the proposition that the school is a society which must be organized on the lines of an ideal democracy. Without pushing analogies too far, we may say that the master ought to assume the rôle of constitutional monarch, having certain

prerogatives and vetoes, but, in the main, guiding and interpreting public opinion.¹ He is the representative of the wider society, and his function is to be *liaison* officer between it and the smaller society of the school. Such a view is crystallized in the present-day fashion—surely unnecessary—to eschew altogether the words ‘teacher,’ ‘master,’ and ‘mistress’: thus the Montessorians talk of directresses, while Mr Norman MacMunn styled himself the “chief adviser to the boys of Tiptree Hall.”

Now such a spirit in school-government is the very essence of play. The children are allowed and encouraged to experiment with life and to explore its possibilities, while their instincts of self-assertion, self-abasement, and pugnacity are re-directed and sublimated from their original crude forms to forms of high individual and social value. And the direct preparation for future citizenship given by such play-methods cannot be overlooked.

The play-way in learning may be described as an attempt to break down in school the old antithesis between play and work, to eliminate drudgery, and to impart, even to the learning of the three R's, something of the joyful and adventurous spirit of play. All are familiar with the essentials of the Montessori method, by which children, in playing with ‘didactic apparatus,’ burst joyfully into the arts of reading, writing, and counting. Nor in our enthusiasm for Montessori need we despise the older method of the kindergarten, in which play also finds a place, if on more stereotyped lines. Froebel and Montessori alike saw the painful contrast between the eagerness and alertness of the child at his play and his creeping unwillingly to school. Again, the heuristic method, first applied to the teaching of science by Professor Armstrong, seeks to put the pupil in the position of the discoverer, and to give him the elation of “some watcher of the skies when a new planet swims into his ken.” It aims at engendering in the boy the same attitude of absorption and keenness as is manifested in his hobbies. And although the letter of the method may be criticized, it is the spirit that matters; and the spirit permeating the learning is that of play.

¹ See Nunn, *Education: its Data and First Principles*, p. 112.

One of the most notable experiments in method of recent years has been the school-journey movement. Groups of children are periodically taken away from school to surroundings where the stimulus of reality is imparted to the learning and the social life. Geography is learned from mountains, rivers, valleys, and the seashore, and history from castles, cathedrals, and other relics of bygone days. One cannot doubt the extreme value of such a movement which, although temporarily set back by the War, is steadily advancing from year to year. The only regret is that such a method, full as it is of the spirit of adventure, should have to be confined, under present conditions, to a few weeks at most during each year of school life.

The Dalton plan, which abhors time-tables and prescribed rates of learning, may be regarded as a second working-out of the Montessorian principle of providing the young student with an environment that stimulates learning. Classrooms are regarded as laboratories for the various subjects, and the child is free to choose which subject shall occupy his attention at a given time. Such a method does much to foster the spirit we have been attempting to describe, and its success is undoubted.

Indeed, taking a broad view, there is no limit to the application of the play-way to learning. As a last example we may consider how the play-spirit may permeate the study of culture subjects, the becoming acquainted with the achievements of the human spirit in the past. Formerly teachers did not teach the mathematics of mathematicians, but rather, as Sir T. Percy Nunn has phrased it, distilled a concentrated mathematical elixir, which they administered to their pupils in small doses: they handed out the results of mathematical thinking instead of guiding their pupils through its processes. Such a way is the very antithesis of the new spirit. Man did not thus learn mathematics: he achieved these monuments of thought in the spirit of adventure and discovery. And it is thus that the child will enter into his intellectual and artistic heritage—in the spirit of creative work, of experimenting with his environment. What we have said of mathematics is true of all cultural subjects: they must be presented, not primarily as things to be

learned, but as channels in which the creative spirit may flow and the possibilities of the individual be realized. It is not insignificant that the original meaning of the word 'poet' should be 'maker.' Extending such a notion, we must emphasize our view that the child should be regarded not as a receptacle for facts, but as a joyful maker or remaker of literature, science, and mathematics. And once more we have the play-way.

The Scout movement, perhaps more than any other, is a working-out of the play-way. All aspects of play are here. Scouting is reminiscent of man's past in its atavistic setting, in its sporing, totem poles, camp fires, and games; in it the instincts find full expression and catharsis, and there is valuable preparation for future manhood and womanhood. Intellectual education is not neglected, and its success in one sphere at least has been crystallized in the phrase 'boy-scout geometry.' But perhaps its finest achievements are in character-training.

The founders of the movement may well be proud of having concentrated in one system the whole of the new spirit in education. Their psychology was not drawn from text-books, but derived from a sympathetic understanding of and insight into child-nature, which made it much more practical and valuable. Nor were they within the circle of orthodox and official educators; owing no allegiance to any code, and having no responsibility except that imposed by their own high ideals, they were able to make their great adventure in education in the very spirit of play—play for themselves as well as for their younger friends. They have worked out a method that is influencing educational thought to a paramount degree, and which, more than any other system, has brought home to the average teacher the value of the new outlook. Although it is not our national genius to pin our faith to any one method, some headmasters and headmistresses have gone so far as to convert their junior forms into troops of Boy Scouts and Girl Guides; others, more cautiously and perhaps more wisely, have been content to absorb the spirit of the movement, thereby transforming the hitherto humdrum work of their schools.

Perhaps the clearest measure of its success is its own extension and corollary, the Rover movement. This movement

owes its origin to the fact that the first Scouts, when they grew up, wished to preserve throughout life the stimulus, comradeship, and play-spirit of Scouting. In inventing Rovers they have ensured that they will remain boys always. One of the healthiest signs in present-day education is the spread of the Scout spirit among young teachers, who, we may venture to assert, will be enabled to solve many of their thorniest professional problems by adopting the attitude and methods of the Scoutmaster.

SUGGESTIONS FOR FURTHER READING

- NUNN : *Education : its Data and First Principles*, chapters vi, vii, and viii.
 DREVER : *Introduction to the Psychology of Education*, chapter vi.
 GROOS : *The Play of Animals* ; *The Play of Man*.
 HALL : *Adolescence*.
 McDOUGALL : *An Introduction to Social Psychology*, chapter iv ; *An Outline of Psychology*, chapter v.
 GREEN : *Psychanalysis in the Classroom*.
 SIMPSON : *An Adventure in Education*.
 MACMUNN : *The Child's Path to Freedom*.
 CALDWELL COOK : *The Play Way*.
 NEILL : *A Dominie's Log*.
 ADAMS : *Modern Developments in Educational Practice ; Educational Movements and Methods*.
 PARKHURST : *The Dalton Plan*.
 LYNCH : *Individual Work and the Dalton Plan ; The Rise and Progress of the Dalton Plan*.
 MONTESSORI : *The Montessori Method ; The Advanced Montessori Method*.

CHAPTER VII

PRODUCTS OF DEVELOPMENT

HAVING found, in the instincts, the innate controls of conduct, we must proceed to an examination of the higher controls that are, or may be, acquired by the individual during his lifetime. Our minds grow as a result of the commerce which we hold with our environment: on the basis of the innate dispositions acquired dispositions are formed, and these, in turn, are welded into an organized whole. In the present chapter, then, we set ourselves the task of outlining, in terms of our hypothesis of mental structure, the growth of the mind on its affective-conative side.

If the student who has followed the argument up to this point were asked what are the acquired controls of conduct he would probably point to habits. Great stress used to be laid on habits by moralists in general and educationists in particular; they were regarded as an explanatory principle of behaviour, as tyrannical entities which, when once firmly established, could determine our destiny. Character was regarded as a bundle of habits; good habits, therefore, were to be assiduously cultivated, while bad were to be avoided. In modern works on education, however, we look in vain for any detailed account of habits. We find, instead, references either to conditioned reflexes or to sentiments, according as the writer does or does not subscribe to the tenets of the behaviourist school. But the conditioned reflex and the sentiment are merely alternative ways of describing this great fact of habit.

Modern behaviourism, with its conditioned reflexes, is, as McDougall notes,¹ the latest chapter in the old attempt to explain behaviour in terms of habit. The professors of this school of thought tell us that we are endowed by Nature with certain

¹ *An Outline of Psychology*, p. 177.

motor mechanisms in the nervous system. For example, when a bright light falls on my eye a nervous current runs along an afferent nerve-fibre to a centre in the brain; this nerve-centre is made active in such a way that a nervous current is transmitted along a motor nerve-fibre to the muscles controlling my eyelids, and in consequence I blink. This is an instance of what is called simple reflex action—bodily action which is performed by virtue of nervous mechanisms with which we are endowed at birth. Now two or more such innately organized mechanisms, when thrown into action at the same time or immediately after one another, become linked up by paths of low resistance; thereafter they tend to function simultaneously or in immediate succession. Every instance of such association strengthens the linkage, and finally there is established a 'conditioned reflex'—that is to say, an acquired mechanism which controls conduct. Thus when Pavlov's dog, who was given food to the sound of a bell, finally secreted saliva copiously at the sound of the bell alone, a conditioned reflex had been established. For the behaviourist, then, habitual action or the conditioned reflex is the mechanical working of conjoined motor mechanisms; habits themselves are acquired modifications and conjunctions of nervous structure.

It follows, of course, that instincts must be regarded as innate motor mechanisms—innate habits, in this behaviourist sense of the word. The only difference between an instinct and a habit is that the one is an innate, the other an acquired motor mechanism. Behaviourists seek the explanation of all the behaviour of man, of all his thought and volition, in terms of the mechanical hypothesis just described, and have made serious attempts to formulate a psychology of education on this basis. From behaviourists we may learn much about the working of the nervous system that is of educational importance; when, for example, we wish to study habits of bodily skill we make use of their findings. But it will be remembered that, when we enunciated our general doctrine in Chapter II, we made our choice between a mechanistic and a mental hypothesis, and we have now spent some considerable time in substantiating the claims of the latter. So we have to

inquire what account of habit can be given in terms of our hypothesis of mental structure.

Now habit is not an explanatory principle of conduct: it is useless to ascribe behaviour to a habit, for the habit is itself the behaviour. Habit is merely a descriptive term denoting the repetition of similar actions in similar circumstances, and we must look elsewhere for its explanation. Behaviourists, as we have seen, look to the mechanical working of the nervous system: we shall look primarily to the instincts. We are the more encouraged to do this when we remember that, in our study of the impulse to repeat the familiar, we found a particular instinct—self-assertion—at work. That was one example only of a more general truth, that habits are formed in the service of our instincts, and are to be regarded as well-worn channels in which instincts express themselves. Just as a stream running down a hillside, having once formed a channel, keeps to it, widens it, and deepens it, so an instinct, having found a mode of expression, tends to use that mode of expression again, so rendering it habitual. This view of habit is confirmed by the methods of animal-trainers who, in their efforts to teach tricks, appeal to the food-seeking instinct: the tricks, then, become to the animal modes of behaviour in which this instinct finds satisfaction.¹

Even more generally we may say that habits are formed in the service of our purposes, whether these are instinctive or not. Acquired purposes come into being as a result of the modification and organization of the innate mental structure. The real dynamic of behaviour is not habit, but instinct, together with those further products of development which we have now to study.

In Chapter III we studied simple instances of the formation and consolidation of engram-complexes, and we saw how, by virtue of these acquired complexes, situations acquire secondary meaning. We had to suppose that experience leaves behind it certain after-effects, or engrams, which integrate with one another and with the innate dispositions, so cohering into complexes which determine future behaviour. And we

¹ McDougall, *An Outline of Psychology*, p. 181.

saw that in the complex the bond of union is one of interest, those engrams tending to cohere which matter to the organism in a particular way. These acquired organizations in the mental structure, which we call complexes, are the first products of development: their formation gives rise to habitual behaviour and results in predictable conduct.

Differing from these complexes not so much in kind as in degree are those mental structures which are called sentiments. Now in common speech the word 'sentiment' is not clearly distinguished from 'feeling' and 'emotion,' and yet, as McDougall points out, a distinction is vaguely recognized. We speak, for example, of a sentiment of hatred, but of a feeling or emotion of anger, the difference being that the sentiment is a permanent part of ourselves, while the emotion or the feeling is merely a passing experience. That is to say, a sentiment is a fact of mental structure, while a feeling is a fact of mental functioning. Psychology, as we have already insisted, must clearly recognize the distinction between mental structure and experience: nothing but confusion can result from identifying the sentiments with the feelings they determine.

What, then, is a sentiment? Like a complex, it is an acquired organization of dispositions in the mental structure, the only distinction being one of degree. Sentiment is the name we give to a complex at a certain level of development. When a complex acquires a certain degree of stability, when it becomes an important part of the mind, we call it a sentiment.

The study of a hobby should make the matter clear, for behind every hobby there lies a sentiment. Let us take the case of an enthusiastic sportsman, a man who has clearly acquired a setting of the mind in one particular direction. Our sportsman, when he desires self-assertion, will turn to sport, experiencing his positive self-feeling in a fine performance of some game. He will be more likely to have a submissive attitude engendered in him by a superior performer in his favourite game than, say, by a great mathematician. His combative instinct will find its main channel of expression in sport, and his anger will most readily blaze forth when

some one does not 'play the game.' His curiosity will impel him to seek information about sporting matters rather than about other things; and he may even entertain tender emotion more readily toward a youthful sportsman than toward other young persons. In short, he tends to experience all his emotions in a particular setting: in sport his instincts find their habitual channel of expression.

Now the sportsman was not born thus. He has acquired a mental disposition—a sentiment—which determines him to experience emotions and desires in relation to a particular object: his emotions have become canalized, as it were. Thus the formation of a sentiment involves the linking up of the native affective-conative dispositions with the idea of an object, and results in "an enduring conative attitude" toward that object. The simplest possible sentiment is described in the words of Morton Prince: "an idea linked with an instinct." Here only one primary emotion has become canalized; thus I might habitually centre all my tender emotion on one person. But the typical sentiment involves the functioning of several of the instincts, these being habitually directed toward its object.

The example discussed above is an instance of a love-sentiment, and may be called 'love of sport.' Similarly we may have hate-sentiments, where, again, most of the emotions are experienced in connexion with a certain object of thought—the hated person or thing. We must note that, in order to form sentiments, the mind must have the power to think of objects in their absence. Animals have this power, if at all, only to a very limited extent, and therefore they can hardly be said to have sentiments: yet the intelligent dog may have a rudimentary sentiment of respect, or even one of love, for his master. It will be a profitable exercise for the student to work out for himself examples of sentiments in his own mental life—of love, hate, respect, and contempt.

Meanwhile we may emphasize the point that sentiments lie behind many of our habits, not only of action but also of feeling and thought—mental habits, as we may call them. Habits are formed in the service of sentiments as well as of

instincts: indeed, the genesis of a sentiment consists in the habitual functioning of an instinct through a particular channel of expression. Sentiments, therefore, make for greater consistency of conduct. Instead of chaotic, unpredictable behaviour, we have behaviour that can to some extent be foreseen, once the individual's sentiments are known. It is most important, therefore, to study the sentiments of the people with whom we have to deal, and this we can do only by observing their conduct. If we see three people buy an evening paper, the first turning to the political columns, the second to the sports pages, and the third eagerly scanning the paper for advertisements and reports of concerts, we may safely infer that interest in politics, love of sport, and love of music respectively are important sentiments in their minds.

In the formation of sentiments we see working the great principle of cohesion which we recognized earlier as one of the main powers of the mind.¹ The mind, so far from being a mere bundle of instincts, must from its very nature integrate these instincts into new wholes, creating a higher 'unity in diversity.' Nor does the work of cohesion end here. The mind is no more a bundle of sentiments than a bundle of instincts. As the mind rises to the level of ideational consciousness—that is to say, as it acquires the power of thinking of objects in their absence—it may form many sentiments; but these, from the very nature of mind, must obey the law of 'unity in diversity.' Just as Kepler's three famous laws of planetary motion were included in Newton's law of universal gravitation, and as it, in turn, has been included in Einstein's wider generalization, the whole process giving us a hierarchy of scientific laws, so the sentiments gradually organize themselves into a hierarchy under one dominant sentiment. And just as the wider generalization in physics must be capable of including the lesser laws that are known to be true, so the master-sentiment must be capable of including the others.

Now, as a rule, no ordinary sentiment is capable of assuming this rôle of master-sentiment. My sentiment for sport, for example, will hardly include my sentiment of love for a

¹ See Chapter III.

particular person; indeed, the two are more likely to clash than to include one another. Only one sentiment is capable, from its very nature, of including all the others: it is the sentiment of self-regard, in which all the instincts and sentiments—the conative tendencies generally—are organized round the idea of self. If I can think clearly of myself as the experiencer of certain emotions and as the possessor of certain sentiments, I can form a self-sentiment that will become a principle of unity in my mental life.

How is this idea of the self developed? How does self-consciousness begin? Here we have a question over which much mystery is made, owing to the metaphysical problems involved in the very notion of self. But the educational psychologist need not discuss the nature of the ego, whether, for example, it is a nucleus, or entity resisting analysis, or whether each self is merely the sum of its own experiences. For him the self is merely the subject of experience. As we saw earlier, knowing, feeling, and willing cannot occur apart from some one who knows, feels, and wills. My self, then, is precisely the entity that experiences my experiences. How do I become aware of it? We must realize that we can be conscious without being conscious of self. Probably a dog or a very young child feels pain without forming the judgment, "I am having an experience of pain," and without thinking of himself as the holder of that experience. When we are half asleep our consciousness does not always rise to the level of self-consciousness. For example, a pain like toothache may make a gradual onset, and it is only at a certain point that I begin to be sorry for myself and say, "I have toothache again." Before that stage the pain was probably an element in my experience, but I had not yet recognized myself as the subject of it.

Clear consciousness of self as the subject of experience marks a distinct stage in the social and individual evolution of mind. In the human being it must dawn in early childhood; thus any remarks concerning its genesis are bound to be of a tentative and speculative character. We can hope only to distinguish a few probable factors in the process.¹

¹ See McDougall, *An Outline of Psychology*, pp. 426 et seq.

One of the most important factors must certainly be the distinction that the child, in his efforts to reduce the "big, blooming, buzzing confusion" to order in his own mind, learns to make between himself and everything else. All the features of his experience that are not referred to the outside world, then, remain to constitute the nucleus of his idea of self. In this process, no doubt, language comes to his aid, his own proper name being a handle by which he gets hold of himself and distinguishes himself from other objects. When he says, "Baby do it," he has at least begun to think of himself as an agent, a striver, a feeler.

His own body occupies a peculiar position, being in one sense outside himself, in another part of himself. His own limbs and organs are, up to a point, like tools and toys or other objects in the external world, but they are his in a more intimate sense: they are always with him, he controls them more easily than other objects, and they are the seat of pleasure and pain. So perhaps the very first distinction that he learns to make is between his own body and everything else.

When we see the child expecting outside objects to obey his behests we may safely infer that he is experimenting with this distinction. He soon finds that things resist his efforts and refuse to obey his dictates; that belabouring a teddy bear is a useless procedure. But he begins by imputing his own motives to outside objects, projecting into them his own capacity for feeling and striving. Perhaps we never quite cease to personify things; even when we are grown up we tend to be annoyed with them rather than with ourselves. In any case, we get our first ideas of objects from ourselves, not our ideas of self from objects: our own inner experience is always the fact of primary importance. In the race we see the same tendency at work in man's early anthropomorphism. Primitive man deified mountains, winds, and streams, regarding these hindrances to his activity as beings made in his own image.

Now if the universe consisted only of the baby and inert objects, perhaps a rudimentary idea of self might come to birth in the mind of the former. The baby who has learned to distinguish between himself and everything else, helped perhaps

by the continuity of his bodily sensations and his emotional life, might acquire a vague sense of personal identity. But such an idea of self would be mainly one of the body, that thing which is always with one, and which, as the seat of pleasure and pain, is of special importance.

It is, in fact, the social environment which develops, in the growing child, any adequate idea of self. How does the child learn to make his second great distinction, that between persons and things? We may at least be certain that he makes it as a matter of interest to himself. Persons and things affect him differently, the former making sounds, moving about, supplying his physical needs, and ministering to his comfort, the latter remaining cold and indifferent.

We have just seen how he attempts to project his own feelings and desires into things: he now carries on the same process with persons and achieves a much more satisfactory result. Nature has endowed him with an impulse to imitate the facial expressions, the sounds, and the actions of the people round him, and his imitative actions are, no doubt, accompanied to some extent by the appropriate emotions. Thus, in terms of his own experience he learns to understand the attitude of others toward himself. Again, in his play he projects himself into various characters, so realizing more fully the motives and behaviour of other people. When a small girl nurses her doll or tries to comfort her baby brother, she is learning the attitude of her mother toward herself. By these processes of imitation and projection the child's own mental life is enriched, and he is enabled to think of himself as a being like those who surround him.

Understanding now to some extent what it is to praise, blame, reprove, punish, console, he realizes the attitude of others toward him, seeing himself as others see him in the mirror of his social environment. All educators should realize that the child accepts the ideas of others about him, and that they form an important constituent in his idea of self. The child who is continually being told that he is naughty will soon accept naughtiness as an element in his own character and will behave accordingly. Adults too know the difficulty of

holding their heads high when candid friends persist in making unfavourable comments on their appearance and behaviour.

As the idea of the self in relation to other selves becomes clear by interaction with these other selves the self-sentiment begins to be formed. Just as a single sentiment may be organized round the idea of sport, so a comprehensive organization of the emotional life may be formed round the idea of self that has been created. The self-sentiment cannot be a prominent entity unless the idea of the self is clear. If I am to possess a strong self-sentiment I must know myself as the possessor of certain instincts and sentiments. But any hierarchy of sentiments which exists must be under the governance of the self-sentiment, which is a synthesis of sentiments and instincts, the self being the co-ordinating factor of all.

Before we proceed further with the questions of character and will we must refer to the moral sentiments. It is possible to acquire a sentiment for anything that can be an object of thought, and therefore, when we are capable of conceiving such notions as justice, truth, virtue, or purity, we may have sentiments of love toward them. Similarly we may have complementary sentiments of hatred for injustice, lying, or depravity. McDougall points out that moral sentiments tend to be bipolar: when we have a sentiment of love for any moral quality we tend to have a sentiment of hate for its opposite. Yet love of truth is not the same thing as hatred of falsehood, for a love is a much more fruitful thing than a hate in our lives.

A love, since it urges one to explore and develop the riches of its object, is a principle of growth, of expansion; a hate, since its aim is to destroy relations with its object, is, so far, doomed to sterility.¹

How are the moral sentiments acquired? They are certainly a product of social life; it is difficult to see what moral sentiments could be acquired by a person living in isolation. For one thing, we need the aid of language to enable us to think at all of moral qualities: we need to hear them talked about. Many moral sentiments are traditional to certain nations and societies; love of courage and fair play, for example, are said

¹ Nunn, *Education: its Data and First Principles*, p. 165.

to be typical of our own race. The child as he grows up in a society acquires its traditional sentiments; but how? As McDougall says,¹ "In the main, it is by sympathetic contagion and by suggestion from admired personalities that the child's moral sentiments are shaped." The genesis of sentiments follows the order of concrete particular, concrete general, and abstract. A child develops a love for a particular person in his environment—here we have a concrete particular sentiment; he extends that sentiment to include in its object all people like the first—now it is a concrete general sentiment; finally he may acquire a sentiment of love for a quality that such people embody—and we have an abstract sentiment. He may love a man who is courageous, then he loves all courageous men, finally he loves courage itself.

It is important for the educator to realize that moral sentiments are normally formed in this way, and that the child ought to be surrounded by examples of the qualities which it is desired that he should himself develop. When he becomes adolescent he may turn to history and literature to find his heroes, and the example of Jesus or Socrates may enable him to develop high moral qualities in himself. The fact that the power of the Christian religion depends on the personality of its Founder clearly bears out the contention that love of moral qualities begins by love of a person who has these qualities.

Moral culture consists in the acquisition of such moral sentiments, in reflection on them, and in the incorporation of them in the self-sentiment. If I conceive myself as a lover of virtue, truth, and purity, I am likely to show forth these moral qualities in my daily life. In discussing these matters, however, it seems desirable to make a distinction between actuality and aspiration. My self-sentiment is the organization, round about the idea of self, of all the sentiments I actually possess. What of those moral sentiments which I do not yet hold firmly but to which I aspire? Such sentiments may be called ideals, and we can conceive an ideal self that will embody them and build up a sentiment round such a conception. The more we fall in love with this ideal self, the more likely we are to realize it. If

¹ *An Outline of Psychology*, p. 436.

we conceive it clearly and strive toward it we are mounting to the highest levels of moral development.

We may now understand the nature of character, that goal of all educative effort. Character is just the organized self—the organization of our instincts and sentiments into the master-sentiment. Character is strong when the organization is close and comprehensive; it is weak when there are loose ends lying about, as it were—when there are stray, unorganized instincts and sentiments acting more or less independently of the self. But high moral character is more than this, including, as it must do, moral sentiments and ideals organized under a clear conception of an ideal self.

Character, however, is not wholly the result of nurture. There is little doubt that individuals are natively endowed with instincts in relatively varying strengths, and these differences are bound to result in differences of character. Moreover, we have a second native basis of character in temperament. Temperament is a native mental quality which has, in the main, a physical basis: modern psychology agrees thus far with the medieval philosophers who ascribed temperamental differences to the amount of the various 'humours' in the body—the choleric, the phlegmatic, the melancholic, and the sanguine. It is known that the chemical changes going on in the tissues of the body affect the nervous system and therefore the mental processes; that the workings of the digestive and muscular systems affect our mental life; that the mode of working of the nervous system itself is natively determined; and that the secretions of the ductless glands, such as the thyroid, have far-reaching effects on the mind of the individual. Such bodily factors are almost wholly determined by heredity, although they can be influenced by dieting and drugs; and one cannot doubt their importance in our mental life. Although they colour our character, however, they do not determine its shape. A high moral character is possible to every sane individual. Native differences in temperament are merely the bases of individuality—the bricks out of which a character can be fashioned.

The problems surrounding the nature of will are some of the most difficult which arise in psychology and ethics. It would

be idle to pretend that any facile solution of these problems is offered here, but by following McDougall we may fruitfully relate the phenomenon of will to the doctrine of instincts and sentiments which we have been considering. McDougall's account may certainly be taken as a working hypothesis by the educationist. The main problem of will may be stated in a word. How does it come about that the relatively weak moral sentiments can triumph over the instincts with all their hereditary power concentrated in channels of habitual expression? For, indeed, even in the face of such promptings, moral sentiments are frequently triumphant. Such facts are expressed in mathematical fashion by William James: ¹

Ideal impulse *per se* < Instinctive propensity,
but Ideal impulse + *E* > Instinctive propensity,

where *E* is the extra dynamic brought to bear on the situation—the will, in other words. What is the nature of this *E*?

Many thinkers have been content to let the *E* remain an unknown quantity. To-day, indeed, there is an important school that regards human behaviour as mechanical up to a point, the will being an extra faculty—a *deus ex machina*—which becomes active at critical moments, superseding the mechanical working of the mind. Such a view, however, seems unbiological, involving as it does a discontinuity between human and animal life. It will be more fruitful to look for an explanation, as McDougall does, in terms of the sentiments and the self-sentiment. What turns the scale in the unequal conflict between a moral sentiment and an instinct is the desire that I, my self, shall realize in action the ideal of conduct that I conceive to be part of my ideal self. In other words, the extra dynamic is the whole of the sentiment of the ideal self being brought to bear on the situation. The will, then, is this sentiment, the highest organization of the self, coming into activity; it is “the organized self in its dynamic aspect”; ² it is character in action. What really conquers the individual instincts is not some new, mysterious

¹ *The Principles of Psychology*, vol. ii, p. 549.

² Drever, *Introduction to the Psychology of Education*, p. 136.

faculty that is unrelated to them, but the instincts themselves, organized into sentiments which, in turn, are organized into a strong self. The secret of power lies in organization, in the creation of "unity in diversity."

This view of the will is borne out by a consideration of ordinary language. As Nunn points out,¹ the picking up of a pin may be motivated by a mere sentiment for tidiness, or due to a superstition that such an action will bring a day's good luck; if, however, some one comes along and challenges my right to pick up the pin I say, "I will pick up that pin," and do so. The word 'I' implies that my whole self is now concentrated on the action: there can be no willing for me unless *I* will. We can apply a similar analysis to that masterpiece of psychology, the story of the Prodigal Son. The lad, after living under the sway of his baser instincts, "when he came to himself" said, "I will arise and go to my father." As we say in ordinary speech, he 'pulled himself together'; which, in psychological language, means that he brought whatever organization of moral sentiments he possessed to bear on the situation, and his will, however feeble, triumphed over his instincts and his pride.

Strength of character and of will, then, depends on the comprehensiveness of the organization of the conative tendencies. We identify these tendencies with our ideal selves where we can: where we cannot we recognize them for what they are, and keep them in subjection to the master-sentiment. Self-respect is of the greatest importance; when it is lost character goes to pieces and the will becomes feeble, and only its restoration will enable the character to be reintegrated.

The foregoing discussion is clearly of importance to the educator, raising as it does the questions of training character and will. Further, our remarks on bodily habits at the beginning of the chapter bring up the question of training in skill. We shall now consider these topics very briefly.

The development of character consists in the sublimation of the instincts, in the building up of the sentiments, especially the moral sentiments, and in the welding of these into a strong

¹ *Education: its Data and First Principles*, p. 199.

self. The educator can do much to foster the growth of worthy sentiments by being himself an exemplar of the desired qualities, and by holding them up as ideals to be achieved. It has been proved, for example, that if children are trained to be tidy in one task only they will remain untidy in others; if, however, tidiness is held before them as an ideal the training will spread from one task to another and a sentiment for tidiness will be formed. Sentiments are consolidated by habitual action, and, when formed, make for consistent conduct. Indeed, such consistency is the only test for the formation of a sentiment.

In order that the sentiments may be united in a strong self, the idea of self must be clear. There can be little doubt that the modern educational doctrine of respecting the individuality of the child does much to give him a clear idea of himself and his powers. When educators cease to expect their pupils to conform to a preconceived type and encourage them to be themselves—or rather, to become themselves—we may look for a great advance in the art of character-training.

Now every good school does give serious attention to the problem of character-training; using as its instruments its tradition, its corporate life, its games, its instruction, and the influence of its teachers, it succeeds in fostering sentiments of great individual and social value, which, when organized into a self, result in a satisfactory character. It does not, however, follow that such a character necessarily brings in its train a strong will. Training in the specific power of voluntary decision is a special problem, which, even in good schools, is too apt to be neglected.

It is helpful to realize that the will, since it is character in action, exhibits the threefold aspect of all mental life—conation, affect, and cognition. Naturally, in an act of will the conative aspect is the most important, since willing is horme raised to its highest point; but this must not blind us to the importance of the others. We have already studied the affective aspect in the organization of the instincts, with their accompanying emotions, into sentiments, and of sentiments into the self, and we cannot have will at all without such

organization. The vigour of an act of will depends on the degree to which these organized instincts and sentiments find satisfaction. We have said little about the cognitive aspect, but it too is an indispensable factor. We cannot form sentiments unless we clearly conceive their objects, and we cannot have a self-sentiment without a clear notion of self. Nor can we will effectively unless we visualize clearly the end of the act of will, thinking it out and relating it to the sum-total of our purposes; further, we must, from the very nature of the act of will, think out the means of achieving it. In this thinking out of ends and means we have a pronounced intellectual element.

Realizing, then, that none of the three aspects may be neglected in will-training, we may consider each separately. We have already dealt with the affective aspect in the building up of sentiments and the self. We shall best consolidate sentiments, not by talking about them, but by allowing them to issue in action. Moral talk may easily be overdone, and undue stress on the affective aspect of the training will lead to sentimentality. For it is easily possible for a sentiment itself to become the object of a new sentiment: a person, for example, may fall in love with his own patriotism, hugging it and nursing it to keep it warm.

The cognitive aspect of will-training must not be neglected. As the intellectual powers develop the child must be trained to deliberate, to think out the consequences of his actions and to relate them to his whole life, to look before he leaps. He must think not of momentary advantage, but of permanent gain. If he learns to institute a delay between an impulse and its response he will strengthen his powers of self-control and become better able to resist temptation. Here we have the truth underlying the maxim, "Before you say an angry word count ten." But, again, the training in deliberation may be overdone. We all know people of the Hamlet type who deliberate overmuch, who are incapable of making up their minds, perpetually saying, "On the other hand, there is this to be considered." Such people may be of unexceptionable moral character, but they are feeble and ineffective in action.

It is the conative aspect, most important of all, that tends to be neglected in schools. The will is trained primarily by being exercised under suitable conditions. If we would foster the power of willing in our pupils we must give them opportunities of making their own decisions, providing situations where they must decide and act on their own responsibility. All real experiments in self-government and individual work are good in this respect, since they give responsibility to pupils. We are realizing now that we are not doing the best thing possible for children when we make their decisions for them and guard them overmuch from the effects of their own inexperience. When, as one often hears said, strong-willed parents have weak-willed children the defect in will-power of the latter may fairly be attributed to want of exercise. It is useless to think that a youth who is carefully guarded from error until he is grown up can go into the world and successfully manage his own affairs. (Education signally fails if it produces a character of mere negative virtue that is so afraid to do wrong that it never does right.) No doubt this conative aspect of will-training may be overdone: we do not wish to produce mere obstinacy and rashness. But all moral education must include practice in decision, and if the cognitive and affective aspects of character-training are likewise attended to, the decisions made will ultimately be wise as well as good.

Lastly, we must inquire how skilled movements are most effectively acquired—how the bodily mechanisms can best be brought into the service of the mind. All our complex performances depend on skill having been acquired in more elementary matters. A pianist, for example, could not play a difficult passage of Chopin if he were unable automatically to perform the more elementary operations of scales and five-finger exercises. We build up hierarchies of habits, however, not in order that we may become automata, but that our consciousness may be free to deal with matters of ever-increasing complexity and difficulty.

Skill may be defined as "facility in doing something." The term, however, is usually applied to acquired rather than to

innate aptitudes. We talk of a skilled performer on the tight-rope, but not of a skilled walker. And yet the skilled performance must always be built on the basis of the innate bodily mechanisms: the tight-rope performer, for example, has acquired his skill on the basis of his power to walk and balance his body. In the acquisition of skill imitation¹ is of great importance. One watches another perform an action which seems desirable, getting a general idea of it and a vague notion of the means toward it. Then gradually, by a process of trial and error, a successful copy of the action is made. In the first clumsy attempts there is imperfect co-ordination of bodily movements, leading to the performance of many superfluous actions. A small child learning to write uses his whole body, and usually sticks out his tongue; an amateur pianist practising a difficult passage frequently makes facial contortions that have nothing to do with his performance. But as skill is acquired the clumsy and unnecessary actions are gradually eliminated, the successful movements are consolidated, and an effective engram-complex is formed to govern the whole performance.

In investigating skill psychologists select a suitable task, such as the solving of mechanical puzzles, mirror-drawing, typewriting, or telegraphy, and estimate their subject's performance on successive occasions. The time taken to perform the task, or the amount done in a given time, is noted, and a graph drawn. A graph of the errors made is usually added. It is found that the subject improves rapidly to begin with, a fact for which it is difficult to account on any mechanistic hypothesis. The improvement is more probably due to emotional factors such as interest, enthusiasm, and feeling of novelty.

'Plateaux' are a characteristic feature of the learning process—the graph becomes flat, indicating a period where no improvement in performance is made. It was believed at one time that this phenomenon is universal in learning; not all experimental evidence, however, supports such a contention, for progress is sometimes fairly regular over a

¹ See Chapter XV.

long period of time. But, on the whole, plateaux are to be expected. What is their explanation?

Bryan and Harter experimented on the learning of telegraphy, which is not a simple habit, but rather a hierarchy of habits, the later and more complex rising out of the earlier and more simple. There is, first of all, the letter-habit, then the word-habit, and, finally, the phrase-habit, each built on the one which precedes it. These investigators believe that when a plateau appears some higher form of habit is being attempted before the earlier one on which it is based has been perfected, and that the plateau continues until the lower-order habits are made automatic. Plateaux may be due to a shifting back and forward between rival methods; they may also be due to discouragement, boredom, or the disappearance of interest. It is important to realize that, taking a long view, plateaux do not necessarily represent a halt in the learning process. Although performance for a time does not improve, it may well be that necessary consolidation of the engram-complexes is going on beneath the surface.

The learner must get away from the plateau if his skill is to improve. If Bryan and Harter are correct an important factor in his doing so must be the perfecting of the lower-order habits. But further advance is almost certain to be made if he makes an effort or reacquires interest in his task. Frequently he adopts some device which his random efforts have proved to be fruitful. There is some doubt, however, whether conscious or unconscious adoption of good methods is the more successful. Perhaps, as Swift maintains, the good method is found by chance, but it is only when the learner adopts it consciously that an advance is made.

Quite probably plateaux are due to more than one cause, and methods of getting away from them may vary considerably. It seems only common sense not to allow the learner to become habituated in bad methods, but rather to suggest good ones. He may not find the best method by random trial and error, and variations in his method may fail to make their appearance at all. But clearly a suggestion will be most effective if it is made at the psychological moment, when the need for it

is felt. Further, an important function of the teacher is to prevent his pupil from becoming discouraged when on the plateau, for such discouragement only prolongs the period of stagnation.

Practice of any skilled action, to be effective, should be carried out when the subject is feeling in good form. It is useless to practise when one is feeling fatigued: not only is no advance made, but actual retrogression may take place. Generally speaking, it is successful practice that is effective. Moralists sometimes extol the blessedness of failure, but, from a point of view of practical efficiency, no benefit is to be gained from doing things unsuccessfully. Here, as elsewhere, "Nothing succeeds like success."

It is very important for the teacher to know the optimum length of a period of practice; in this connexion the investigations of Pyle are important. To begin with, he varied the length of the practice period, keeping constant the time-interval between successive practices. He found that time was spent most economically by adopting thirty-minute periods, fifteen minutes being too short and forty-five too long. It is easily possible to adopt too short a period, for the learner always needs time to settle down to his work. In a further experiment Pyle kept the length of the practice period constant, varying the length of the time-interval. He found that daily practice is better than practice on alternate days. A second period of practice on the same day is not so beneficial as the first, while further practices that day are still less beneficial. Of course, two periods of practice on the same day give better and quicker results than one only; but since, as Rusk puts it, "the total time at the teacher's disposal is limited, the question that interests him is how best to utilize the pupil's time, not what he could do with double the time."¹ Pyle corroborated these results by giving school pupils practice in addition, one group being given practice ten minutes per day, in the mornings only, for a fortnight; another ten minutes, morning and afternoon, for a week only. The results showed the superiority of the former. Thus it is easily possible for a zealous teacher to drive his pupils too hard.

¹ *Experimental Education*, p. 219.

In the acquisition of skill it is undoubtedly true that the emotional factors count for much. Moderate practice governed by interest and effort will achieve better results than prolonged practice where interest and effort are lacking. It is most important for the learner to take an interest in what he is doing, and to be confident of his ability to do it. It has been found, too, that knowledge of his own progress acts as an incentive. If the practice can be related to some dominant purpose of the pupil's, then he will, of his own accord, make the successful efforts that lead to progress. It is the duty of the teacher to provide these emotional incentives to effort. Our initial contention, that habits are formed naturally in the service of instincts and sentiments, will guide him in his endeavours to instil habits of skill into his pupils.

SUGGESTIONS FOR FURTHER READING

- McDOUGALL : *An Introduction to Social Psychology*, chapters v, vi, vii, viii, and ix ; *An Outline of Psychology*, chapters vi and xvii.
SHAND : *The Foundations of Character*.
NUNN : *Education : its Data and First Principles*, chapters xii and xiii.
JAMES : *The Principles of Psychology*, chapter iv.
DREVER : *Introduction to the Psychology of Education*, chapters v and vii.
RUSK : *Experimental Education*, chapter xiii.
SANDIFORD : *Educational Psychology*, chapters ix, x, and xi.

CHAPTER VIII

STAGES OF DEVELOPMENT

We must now trace in brief outline the process of growing up, distinguishing the various phases by which the erratic, impulsive child may become the steady, reasoning adult. To such a study we have an excellent guide in Dr Ernest Jones, who, in an important paper,¹ has pointed out that human development takes place in four well-defined stages: infancy, up to the age of five; late childhood, up to the age of twelve; adolescence, up to the age of eighteen; and, finally, maturity. He teaches us further that we grow up twice, as it were, achieving a pseudo-maturity before puberty, at which age Nature seems to undo most of her previous work and begin again the process of building up and consolidating the character. But perhaps his most distinctive contribution to the psychology of development is his doctrine that adolescence and adulthood are, respectively, recapitulations of infancy and late childhood, the individual living over again, on a different plane, the phases he has passed through in earlier years. Thus the contrasts that we find between a child and an adult depend on the particular periods that we compare, the true contrast being between infancy and adulthood, not between late childhood and adulthood, which have many points of similarity. Dr Jones' argument is based on psycho-analysis, and is concerned mainly with sexual development, but he believes his theory to be true of aspects of mind other than the sexual. With it to guide us we may profitably try to distinguish the main characteristics of the various stages, and their similarities or contrasts.

One of the most obvious differences between a young child and an adult is in intellectual stature. Intelligence tests have

¹ "Some Problems of Adolescence," *Brit. Jour. Psych.*, vol. xiii, 1922-23.

revealed the fact that native ability unfolds gradually from early childhood to maturity. But Dr Jones warns us that the tests have been compiled too much from the adult standpoint; he is impressed by the bold initiative of thought, by the searching and sceptical spirit of inquiry displayed by a young child, and is inclined to think that these intellectual qualities become positively blunted by increased age and education. Although we should bear his warning in mind, we must allow that there is a marked difference in intellectual power between a child and an adult.

The behaviour of a young child differs from that of an adult in being governed directly by instincts which clamour for immediate satisfaction. He learns only gradually to inhibit his natural impulses and interpose a delay between stimulus and response. Each impulse acts independently, since it is not as yet related to other impulses and to the personality as a whole. We have here the lowest stage of moral behaviour, in which conduct is motivated solely by instinct and modified only by the pleasures and pains incidentally experienced. It is typified, as McDougall points out, in the proverb, "The burnt child dreads the fire." Later on the social environment reinforces this pleasure-pain motive by administering rewards and punishments more or less systematically.

Again, the young child is characterized by his attitude of dependence. It is well to note that this dependence is not concerned chiefly with physical comforts—the child takes these for granted—but is manifested rather in connexion with his emotional needs. His whole nature calls for love to be directed toward himself. Now this attitude of dependence is seldom, if ever, completely lost; but, since successful growing-up consists in becoming self-reliant, it may well be noted as an outstanding characteristic of early childhood.

A further characteristic is exuberance of imagination. We have already noted that childhood is the age of fantasy, the hero of the fantasy being the child himself, who in this rôle is finding compensation for the harsh realities of actual existence.

We noted also his tendency to achieve self-assertion in repeating the familiar. This repetition-compulsion, as Freud calls

it, is the child's impulse to reply to a deep impression, and to endeavour to become master of a situation. Negative and positive phases of behaviour alternate with and occasion one another. The child is continually being impressed with persons or situations which evoke negative self-feeling or even fear; but the complementary phase is certain to supervene, usually in his play, when he enacts the part of the person or the situation which has overawed him.

The complementary nature of these negative and positive phases was strikingly exhibited in the behaviour of a small boy well known to the writer. For some obscure reason, in the presence of a coalheaver he showed every sign of extreme fear—blanching, crying, and running for protection. His favourite form of play, however, was to utilize cushions as bags of coal, delivering them over his head on the knee of any sympathetic adult. This make-believe was clearly a reply to the situation in which he played so humiliating a part. The same child was taken to the Zoo at the ripe age of three. When brought home he exhibited a disappointing reticence over his marvellous experiences, but again the reply could be seen in his play for many months afterward.

This natural rhythm of submission and elation is of great importance throughout life. We frequently find ourselves in situations which would be altogether unbearable if we could make no reply to them: we can, for example, just bear acute anxiety about a loved one if we can do something to comfort or help that person. In early childhood this characteristic is tremendously important, and must be taken into account by the educator in all his dealings with his pupils. Its application to teaching is recognized in the well-worn but thoroughly sound maxim, "No impression without expression."

Perhaps the most outstanding and undeniable way in which an adult differs from a child is in his sexual maturity. Before the days of psycho-analysis it would have been maintained that the young child has no sexuality whatsoever; but now we are authoritatively informed that it is no longer possible to deny that his sex-life is exceedingly rich and varied in both its physical and mental aspects, its manifestations resembling those

of primitive man, and being, in turn, auto-erotic, homosexual, and heterosexual. After the period of early childhood there is, according to Freud, a latent period until the advent of puberty, when again sexuality dominates the whole mental outlook.

While the young child is behaving on the lines that have been indicated, his emotions begin to be organized into sentiments, the most primitive of which is probably his love for his own body. The first acquired organization of the conative tendencies would seem to be built up from the bodily appetites and the pleasures and pains experienced in connexion with the physiological functioning of the body. Infancy is an age of auto-erotism, or self-love in a bodily sense. 'Narcissism' is the name given to this body-sentiment by the psycho-analysts, who see in myth and legend a dramatization of the mental history of mankind. In the legend of Narcissus they find an enactment of the universal tendency to fall in love with ourselves.

Soon, however, the hormone or libido of the child is directed outward, and a sentiment round about the idea of the mother is formed. Clearly such a sentiment will begin as an extension of the body-sentiment, for the mother is the person who feeds the child and ministers to his bodily comfort. But this sentiment, although it begins as a sort of cupboard-love, soon transcends its lowly origin; and it is no exaggeration to say that it dominates the adult lives of most people, sometimes consciously, more often unconsciously.

The father, being another constant and important factor in the child's environment, also becomes the object of a sentiment. Here we are confronted with the startling dogma of the Freudian school, that, while the mother-sentiment tends to be a love, the father-sentiment—in the case of the boy, at least—tends to be a hate. It is argued that the boy resents the presence of his father, regarding him as a rival for the affection of the mother, and being jealous of his influence over her. This father-mother-son situation constitutes the *Œdipus complex* of the Freudian psychology, "the ark of the Freudian covenant," as it has been aptly called; *Œdipus* being the legendary hero who, exposed to die in infancy, lived to slay his father and

marry his mother. The complex, we are told, is normally repressed, as it conflicts with the moral ideas of its possessor, who is, therefore, unaware of its existence.

We need not subscribe to all the arguments of the Freudians in this matter; but common sense indicates that, if the father is unsympathetic toward his son, if he, albeit unconsciously, comes between him and his mother, if in the child's life he constantly enacts the rôle of the stern disciplinarian, then he may tend to be disliked. It is true that the bond between mother and son is usually closer than that between father and son, and that a boy is frequently awkward and diffident in the presence of his father. Now teachers are parent-substitutes in the eyes of the child, and men-teachers in particular should realize that any attitude of dislike or resentment that may exist toward the father tends to be automatically transferred to them. The Freudian doctrine here may help us to understand the not infrequent case of the boy who, in spite of anything we can say or do, seems to delight in frustrating our best efforts.

In girls the complex is said to take a complementary form, involving a tendency to dislike the mother and love the father. It is called the Elektra complex, since Elektra was the heroine in Greek mythology who, for love of her father Agamemnon, assisted her brother Orestes to slay her mother Clytæmnestra. But the Freudians have some difficulty in explaining why the girl should dislike her mother, and their account of this complex is unconvincing, to say the least of it. It can be admitted, however, that at a later stage the relations between father and daughter are frequently of a very friendly nature.

Whatever the amount of general truth there may be in the Freudian theories of these complexes, it is at least certain that the early attitudes of the young child toward his parents, brothers, and sisters are of abiding importance, and that throughout life they tend to colour his emotional relations with other people. Freud and his disciples have done great service to psychology and education in directing attention to the early years of life. Never again will the individual change and advance so much in a given time.

We find that as development proceeds mental growth, like physical growth, does not proceed uniformly, but in waves. Nature seems to alternate periods of consolidation with periods of advance. Now in these early years the growth of the child is not uniform. He advances rapidly up to the age of three, after which he has a period of consolidation. At the age of six or seven he again has a period of rapid development, which is followed by one of remarkable stability. This stability, both physical and mental, is the most outstanding characteristic of later childhood. A being, say from another planet, who did not know the human race, might well take these well-adapted small people of ten years for the adults of the species, if the actual adults were withheld from his view. Late childhood, then, may be regarded as a period of pseudo-maturity. The boy of ten or eleven is very much at home in the world, and knows how to deal with all the situations that confront him.

All who have studied development have noted this period of arrest and consolidation, and have sought to explain it. Stanley Hall, invoking his favourite doctrine of recapitulation, regards later childhood as "the present echo of a long phyletic stage when for many generations our prehuman forebears were pigmoid adults, leading short lives and dying out at or before the pubic growth increment now occurs."¹ Whatever the explanation may be—and that of Hall seems to be the only feasible one—it is at least a matter of observation that by this age the child has gone once round the spiral of development, that he has achieved a degree of adaptation to environment which he will lose during adolescence and regain at the age of maturity proper.

A second well-marked characteristic of later childhood is the ripening of the gregarious instinct. It is true, of course, that the child in his early years does not like to be alone, but he uses his elders chiefly as a means to self-gratification, being sublimely selfish in all his doings. Now, however, he begins definitely to herd with other boys. He no longer ploughs his lonely furrow, but finds the company of others like himself an

¹ *Adolescence*, p. 45.

indispensable means of self-assertion. So he almost invariably becomes a member of a band or gang, which meets regularly to play glorious games and transact business whose nature is not divulged to older people.¹ His mother is frequently grieved that her darling now regards her merely as a convenient person who provides him with food and shelter while he finds the real joy of life elsewhere; she must recognize, however, that such is the normal course that her boy must tread on his way to healthy adulthood.

At this age, then, we have the gregarious instinct in its purest form. Higher forms of social behaviour are not yet manifested: the boy, as Nunn puts it, "still regards the world as his oyster, but demands the help and countenance of others in opening it."² He is, psychologically speaking, a member of a primitive hunting-pack, and cannot yet be expected to exhibit altruism and self-sacrifice. But the alternation of positive and negative phases of behaviour may again be noted in his positions, sometimes as leader, sometimes as one of the led. All gangs of young boys are organized: captains, vice-captains, and other officials are appointed to direct affairs and enforce discipline.

It is this extreme gregariousness that gives us the clue to the understanding of the moral sanctions that govern the conduct of the young boy. His behaviour is determined largely by anticipation of social praise or blame, the chief authority being the gang. Here we have the essence of all 'morality,' which, to begin with, at least, is nothing more than the *mores*, or customs, which make for the well-being of the social group, and which change as the needs of that group change. It is only when morality becomes linked with an idealistic religion that it acquires any degree of absoluteness.

The morals of later childhood, then, are ruled by public opinion, which is notoriously powerful and uncompromising. The boy feels that he owes his first allegiance to his gang, and he will obey the dictates of his leader though the heavens fall. He is frequently in a very real difficulty, belonging as he does

¹ See Stevenson's essay "The Lantern-bearers," in *Across the Plains*.

² *Education: its Data and First Principles*, p. 173.

to other social groups—the home, the school, society at large—loyalty to which frequently conflicts with that due to the gang. Thus we have what is usually termed ‘schoolboy morality,’ the boy cheating and lying to his master in the supposed interests of the gang.

Such conduct, thoroughly unsatisfactory though it is, should be understood and treated sympathetically by the master. He must try to convince boys that he is not the natural enemy of the gang, and make every effort to enlist it, with its energies and loyalties, in the service of the wider society of the school. Here the schoolmaster may well learn from the Scoutmaster, who adopts the psychological method of organizing the natural hunting-pack into a troop of Wolf Cubs, using the gang-spirit for ends which he considers desirable. One cannot admire too much the soundness of the psychology which forms the background of the whole of the Scout movement.

A third marked characteristic of later childhood is the outward look. The boy of ten or eleven is naturally an extrovert—that is, one who is concerned with objects outside himself rather than with his own mental life. He revels in outdoor activities—in games and in camping. His interests are supremely practical: he is intensely curious as to how things work, and he picks up a mass of information on various topics which is a matter of perpetual surprise to his elders.

Our psychology of adolescence ought to be less tentative than that of early childhood, for we have our own recollections to guide us. Yet there is a strong tendency in us to forget this period of life, because of the weakness and humiliation that were such characteristic features of it. This explains the unsympathetic attitude toward adolescents exhibited by many parents and other adults. The student looking forward to work among young people will do well to recall now, before they are forgotten, the events and the mental attitudes of his own adolescent years.

From a theoretical standpoint adolescence is best regarded as a recapitulation of the first period of life, as a second turn of the spiral of development. The adolescent no longer exhibits the stability that marked his later childhood, but

loses his bearings and finds himself in a strange world, where his old habits and pursuits seem devoid of value and meaning. He is badly adjusted physically and mentally, being clumsy and awkward in bearing, moody and intractable in manner. Living under the delusion that he is the focus of every one's attention, he is extremely self-conscious and given to blushing. In a word, like the infant, he has to begin again the work of adapting himself to his environment. Many of his characteristics, as we shall see, are those of infancy repeated on a higher level.

The suggested recapitulation is to be found in emotional attitudes—indeed, the broadest characteristic of adolescence is just the re-orientation of the feeling life that then takes place. Although intellectual stature is now reaching its maximum, all intellectual considerations in adolescent education must be regarded as secondary. The adolescent lives an intensely emotional life, in which we can see once more the rhythm of positive and negative phases of behaviour in his constant alternation between intense excitement and deep depression.

The exuberant imagination of early childhood is recapitulated in a second age of fantasy. Like the young child, the youth finds the world a difficult place, and tends to live in realms of fantasy that are nearer his heart's desire. His boyish interest in the outer world gives way to a renewed interest in his bodily and mental self; he again becomes egocentric and introverted, withdrawing himself from the 'real' world. Scouting, always soundly based on psychology, introduces a strong element of make-believe in its provision for the needs of the adolescent.

But undoubtedly the central fact of adolescence, accounting for and pervading all the others, is sexual development, and nothing but harm can result from the neglect of this essential characteristic. Dr Jones believes that the individual is now recapitulating, on another plane, his infantile sexual history; that there is a reawakening of the repressed sexual impulse which has lain dormant in later childhood. This time it is destined not to be repressed, but directed toward strangers rather than toward the parents.

The recapitulation proceeds in three characteristic stages. First we have auto-erotism. Adolescence is a second period of self-love, which finds direct expression in the secret admiration of and interest in the body, and indirect mental expression in conceit and cocksureness. Next we have a homosexual phase. Adolescence is an age of passionate friendships, sexual in nature, between members of the same sex, an allied phenomenon being the distinct tendency for boys and girls in mid-adolescence to segregate. Here, however, we have a distinct advance on the auto-erotic phase, for we have a directing of the sexual energy outward. Lastly the heterosexual phase supervenes, when the object of attachment is a member of the opposite sex. The dawning of interest in women on the part of the youth frequently takes the form of 'calf-love.' Falling in love with a woman older than himself, he is perhaps unconsciously seeking again the object of his infantile mother-sentiment. His attraction toward such a person is mingled with respect and awe, and he may be helped greatly by kindly and sympathetic treatment on her part.

These three phases of sexual development do not necessarily succeed one another in time, but may easily co-exist. It is essential for the educator to understand them, and to realize that there is nothing necessarily perverted or unnatural about a young adolescent in whom the first two are to be seen. The cruelty with which adults frequently treat adolescent misdemeanours is probably to be regarded as compensation for forgotten weaknesses in their own adolescence. What is needed is an attitude of sympathetic understanding, and the educator whose own adolescence has been comparatively free from sexual troubles need not suppose that such is the case with all the pupils under his care.

Sex, then, is the fundamental fact of adolescence, if not of all life. "Like the overflow of a great river," says Slaughter, "it irrigates and fertilizes great tracts of life's territory"; and the whole business of adolescent education is the 'long-circuiting' of the instinct, the redirection of its energy into legitimate and useful channels. This is no easy business.

The traditional method of English schools is to engage the adolescent in hard, physical games. This may be helpful; but it is unsound to think that enforced expenditure of mere physical energy will rid the youth of his sexual difficulties. Sex is a mental force, and if games succeed it is because of their mental effect as a means of self-expression. A broader and sounder prescription for the inevitable trouble is to seek sublimation in all sorts of creative activity.

No one will deny the urgent need for sex-education. Diffidence and prudery in connexion with this important matter have resulted in a widespread conspiracy of silence which has done untold harm to many a youth. The adolescent must learn the facts about life and his own body in a clean, healthy way, not from unclean talk that gives them a distortion from which it is extremely difficult to recover. What he needs is private instruction from an adult whom he trusts. Not hints, but plain, straightforward talk must be given at the right time.

One does not seek to minimize the difficulty and responsibility of such a task, but surely its difficulty is not commensurate with the magnitude of the service which a wise and sympathetic adult can render a young friend in ridding him of his burden of doubts and difficulties. Many adolescents, not understanding in the least what is happening to them, suffer agonies, thinking that they are lost souls or abnormal or diseased. The particular method adopted is less important than the attitude of sympathy and understanding that is so essential if we are to give any effective assistance. It is of enormous help to the adolescent even to know that his troubles and liability to error are shared by others of his own age, and understood by an older friend.

With this crucial characteristic well before our minds, we may proceed to enumerate others. An attitude of dependence, in sharp contrast to the independence of boyhood, is again seen; the dependence, however, is not necessarily on the parents, but on heroes found in real life, in history, or in literature. Although this attitude becomes less pronounced as adolescence proceeds, it is seldom quite lost, and may always be regarded as the persistence of infantile attachment

to a parent. Young masters and mistresses especially must realize that they are peculiarly liable to be exalted into the position of hero or heroine, and seek to deal with the situation in the best interests of their worshippers. Whoever the hero may be, the wise educator will seek to direct the admiration away from him as a person to the desirable qualities which he embodies. In the attitudes of dependence common to early childhood and adolescence, however, we must note an important difference: in the former period love and attention to the self are demanded, whereas in the latter a love-object is sought to which the self may be devoted. Thus we have in adolescence the beginnings of altruistic conduct.

One working-out of the attitude of dependence is the dawning of religious consciousness. The Christian idea of God as the Heavenly Father makes a great appeal, since the adolescent is unconsciously seeking idealized substitutes for his own parents. In later adolescence this interest in religion is reinforced by an outward-going tendency which carries the youth to the outer limits of life. Again, religion gives an outlet for sex-energy, while it assists greatly in calming sex troubles—the eternal conflict between the spirit and the flesh which is so acutely felt at this time. These attitudes, along with his emotional instability, may lead to conversion, a phenomenon which must not be exploited, but treated solely in the interests of the youth himself.

But frequently the first rapture of religious experience is succeeded by a period of scepticism. The adolescent is disappointed at the failure of religion to solve all his moral difficulties, and is disillusioned by the behaviour of adults who profess religion and who fall short of his ideals. Again, his scientific education, clashing with narrow theological dogma, may give him difficulty: the remedy for this would seem to be a broadening of religious doctrine to include all that science has to teach. He may find in philosophy an escape from his religious difficulties; often enough he is attracted by a Hellenic conception of life—simplicity, balance, and the golden mean. He may devote himself to the pursuit of truth in the guise of science, or of beauty in art forms, though here

he frequently develops a taste for the decadent and the ultra-modern.

His moral conduct in general is chaotic and unpredictable at the beginning of the period. Like the young child, the adolescent has to learn self-control—chiefly, this time, over the expressions of his sex-instinct. He can repress and inhibit his emotional outbursts to a greater extent than the young child, but he is always confronted with the urgent problem of his own sex-life; and he has as little self-control, compared with the adult, as the infant has, compared with the child of ten.

In achieving self-control he is helped by the formation of ideals. His hero-worship ought to result in sentiments of love for the moral qualities of his hero, and the gradual incorporation of these in his sentiment for an ideal self. Adolescence is the age for the final consolidation of the self into something stable and permanent. As it consolidates will-power develops: increasing knowledge enables the youth to see his impulses for what they are, to relate them to one another and to the whole self, and therefore to control them. The highest stage of moral conduct is reached when behaviour is directed by ideals rather than by social praise or blame. There are few who dare to follow the light that is in them, regardless of social consequences, but those few are the salt of the earth.

Finally, the gregarious impulse of earlier years becomes sublimated into definite forms of social behaviour. The self of earlier adolescence is felt to be incomplete; ideals of social service are formed and cherished, and the generous heart of youth abounds in the love of mankind and burns with the desire to help in the creation of an ideal society. The adolescent hitches his wagon to a star, and is, by his very nature, a reformer. The wise educator will seek to direct these altruistic impulses into fruitful channels, and will be indulgent and sympathetic to those young men who see visions.

At the end of the period comes maturity, permanent this time. Interest has again turned outward to the worlds of nature, men, and things. Fantasies fade and reality is faced.

The young man of eighteen is a 'man of the world,' pre-occupied with practical problems, and proud of his knowledge of affairs and his practical efficiency. He chooses a career, which is frequently that of his earlier hero, and gradually pursues his way to complete manhood.

It is one of the most encouraging signs of the times that our national system of education is now being based on a clear recognition of the stages of development which we have described. Nursery schools are provided for those children under five whose homes, for one reason or another, form an unsuitable environment for their tender years. Infant schools, for long the flower of our educational system, cater for children up to seven years of age, and base their curricula and methods on sound child-psychology. One cannot praise overmuch the insight and devotion of those who labour in such schools. The transition to the primary school is made at the correct age of seven, and the child will in future remain there until the age of eleven plus. Primary education should regard the three R's—the tools of learning—as its main business, and seek to garner suitable materials for adolescent education. One cannot doubt that the elementary school at its best has dealt adequately with this period of life.

But up to the present education during the important years of adolescence has been only for the favoured few. The less bright children, who have failed to obtain a place in a secondary or selective central school, have been left, as a rule, to mark time in their old school until the critical age of fourteen, when they have been turned adrift, ignorant and badly equipped for life. Since fourteen is the normal age of puberty in boys (in girls it is two years earlier), it seems little short of criminal that the community should have deliberately ceased its educative effort then. Now, however, enlightened public opinion has crystallized in the Hadow Report, a veritable charter of adolescent education; and its corollary, the raising of the school age to fifteen, will, we hope, soon come within the range of practical politics. Thus universal adolescent education is fast becoming a reality.

How is the educator to use the magnificent chance that the

raising of the school age and the provision of new schools under the report will give him? He must ruthlessly discard the traditional methods of the upper standards of the elementary school where these are unsuitable, and work out the whole problem afresh, guided by the findings of the Hadow committee. Above all, he must subscribe to the creed so eloquently stated at the beginning of the report:

There is a tide which begins to rise in the veins of youth at the age of eleven or twelve. It is called by the name of adolescence. If that tide can be taken at the flood, and a new voyage begun in the strength and along the flow of its current, we think that it will "move on to fortune."

For him adolescence must be the central fact which guides all his efforts.

The report goes on to recommend that the present overlapping systems of elementary and secondary schools should be replaced by an 'end-on' arrangement of primary and post-primary schools. Primary education should cease for all children at the age of eleven plus, and post-primary education begin then, making the slogan "Secondary education for all" a reality. Different types of schools, suitable to the varying needs of adolescents, will be provided; in addition to the existing secondary schools, which should be called 'grammar schools,' there will be 'modern schools,' both selective and non-selective. These will provide "a humane or liberal education, . . . not one given through books alone, but one which brings children into contact with the larger interests of mankind." Their curricula, thought out as a whole for a four-year course, will contain "large opportunities for practical work" and be "closely related to living interests." The treatment of the subjects will be "practical in the broadest sense and brought directly into relation with the facts of everyday life." As a rule, modern schools will "give a practical bias to the curriculum in the third or fourth year of the course," such bias being "introduced only after careful consideration of local conditions," and not being "of so marked a character as to prejudice the general education of the pupils."

The success of such magnificent aspirations depends on more than administrative zeal. The promised step forward will be surely taken only if sufficient men and women teachers can be found who, informed by sympathy, understanding, and enthusiasm, will espouse the great cause of the nation's youth and devote their lives to its service.

SUGGESTIONS FOR FURTHER READING

- JONES : "Some Problems of Adolescence," *Brit. Jour. Psych.*, vol. xiii, 1922-23.
HALL : *Adolescence*.
NUNN : *Education : its Data and First Principles*, chapter xii.
SLAUGHTER : *The Adolescent*.
READ : *The Struggles of Male Adolescence*.
BOARD OF EDUCATION : *The Education of the Adolescent*.

CHAPTER IX

MENTAL CONFLICT

ALTHOUGH little has been said in the preceding chapter about difficulties and abnormalities in development, it is obvious that growing up from childhood to maturity is not always satisfactorily accomplished. The individual has frequently to make a real effort to pass, for example, from adolescence to maturity, and his success is by no means a foregone conclusion. Not only are we liable to remain at one stage when we ought to be passing on to the next, but we are sometimes even in danger of regressing from a higher to a lower level.

The psychological theory resulting from the labours of Professor Freud, and called variously by the names of psychoanalysis, the new psychology, and the psychology of the unconscious, has done much to enlighten us on failures in development and to indicate suitable methods of treating awkward, difficult, and unadjusted children. Although one of the outstanding elements of that theory is the stress laid on sex, it would be wrong to imagine that that is its only, or even its chief, contribution to psychology. It seems, after all, a matter of minor importance whether the primitive *horme* is a sexually coloured libido, or whether it is neutral to begin with. McDougall, who does not subscribe to all the tenets of the Freudian school, emphasizes his own agreement with Freud's main position—that it is only on some such concept as *horme* or libido that a workable psychology can be built. Freud's teaching is concerned primarily with the workings of that part of the mind which is unconscious. For the introspective psychologists consciousness was the mind and psychology the study of apprehended, individual experience; but for the psycho-analyst consciousness is merely the surface of our mental life, the real subject of study being the hidden depths—the unconscious—that can never be discovered by introspection.

In these pages we have identified this 'unconscious' with the hypothetical mental structure, and have sought to emphasize the difference in nature between it and experience. We pointed out that the unconscious has two main attributes—mneme, or the power to conserve elements derived from past experience, and hormone, or activity. Now, in its hormic aspect the unconscious has the power, firstly, of determining experience and behaviour; secondly, of recombining its elements into constellations which have unity of their own. We must now study further this second manifestation of hormone, the endo-psychic process of which the subject is unaware, looking for guidance to Freud and other thinkers of the same school.

In preceding chapters, too, we outlined the growth of the unconscious. We found that at birth it possesses a certain degree of organization into dispositions which, as we must suppose, have been built up in the months of prenatal life on lines laid down by the past history of the race. We saw how experience leaves behind it certain after-effects, or engrams, which are not dead deposits, but active constituents of the unconscious, entering into and modifying the structures that are already there. Then we studied the sentiment, which we saw to be a large-scale organization of the affective-conative tendencies round a common object. Finally we saw that the principle of cohesion continues to apply to the sentiments, which themselves tend to form a constellation round a common object of interest. Since the only object capable of comprehending all the sentiments is the self, the self-sentiment is normally an organization of all the conative tendencies.

But, as we have said, the development so outlined does not always proceed smoothly. If it did the unconscious would always be a perfectly organized unity, acting as one, and determining in no uncertain way the line of behaviour to be pursued by its possessor. In no one is this organization perfect. As sentiments are formed there are stray tendencies, as it were, that will not unite with the others; and as the self-sentiment is formed there are again refractory tendencies or even whole sentiments that will not readily enter into the hierarchy, the subject being unwilling to recognize them as part of the self,

or, at least, of the ideal self. Such lack of organization does not deprive the complexes of their activity: they are still very much alive, endeavouring to function in experience and behaviour, and therefore conflicting with the master-sentiment, or main mental trend of the individual. It is this mental conflict that is at the root of all abnormalities of behaviour.

The subject may be quite well aware of the conflict, and apprehend clearly the urges which impel him in contrary directions. The conflict between the spirit and the flesh, for example, described by St Paul and experienced by every one who has formulated ideals of conduct and tried to live up to them, is very familiar. A little introspection, too, may enable us to see that, on certain occasions, anger is conflicting with tender emotion, or curiosity with fear. There is nothing new in this. What is new is the psycho-analytic doctrine that the conflict may be going on as an endopsychic process, the individual being quite unaware that his mind, beneath the surface, is a battlefield of warring impulses. The explanation of so much hitherto inexplicable behaviour in terms of mental conflict is the great achievement of psycho-analysis.

Now mental conflict is painful and exhausting. Clearly the energy that is expended in it is not available for other uses: the mind divided against itself cannot hope to stand up successfully to a difficult environment. We know how exhausting it is to decide, on the conscious level, between contending motives that are approximately equal in strength; and we learn from psycho-analysis that a state of conflict in the unconscious is just as wasteful of energy. But we have a strong tendency to avoid this mental discomfort. We cannot continue indefinitely to be impelled in contrary directions, and our minds have evolved various methods of negotiating a peace, or at least a truce, between the warring elements.

The most satisfactory solution is found when the conflicting complexes or sentiments are brought into unity with one another or with the self. There may be, as it were, a peace by negotiation. Now endopsychic conflicts cannot be resolved in this fashion unless the self is aware of the situation. If a person does not know that a certain complex exists in his mind he

cannot recognize it as part of himself, or reconcile it with his ideals. It is the task of psycho-analysis, by its special technique of dream-analysis and word-association, to reveal unconscious impulses to their possessor. The stronger the organization of the self, the more will it be able to reconcile warring elements and reintegrate them with the personality: indeed, normality of mind depends on such reconciliation being effected.

This reintegration, however, does not always take place. A refractory complex may be itself so strongly organized, and so important a constituent of the mind, that it is impossible for the main self to dominate it. In such circumstances we have a perpetual state of guerrilla warfare, the contending elements taking turns, as it were, to be on top. Here we have an explanation of the phenomenon of secondary or alternating personalities. A secondary personality is a subsidiary organization of the conative tendencies, which may determine experience and behaviour when the main personality temporarily abdicates. The two organizations tend to be dissociated from one another, the one knowing little or, in extreme cases, nothing of its rival. Many well-known writers tell us that their materials are supplied by secondary personalities and put into order by the main personality. Stevenson, for example, tells us in a delightful essay¹ how the circumstances of his tales are enacted by his "Brownies" in the theatre of his brain, while he himself puts the story in order, dressing the whole in the best words and sentences that he can find. Barrie, too, tells us that he himself is a very sober fellow, and that it is his "M'Connachie" who charms us with the fantasies of *Peter Pan*, *Dear Brutus*, and *Mary Rose*. Such mild dissociations may therefore be an aid to literary genius. Dissociation is found in all degrees, from the case of the person who can automatically switch on various moral characters to suit different social environments to that of the individual with alternating personalities which are mutually exclusive.

We may distinguish yet a third way in which the conflict may be partially resolved. This we may compare to a dictated peace in actual warfare. Sometimes a refractory complex, at

¹ "A Chapter on Dreams," in *Across the Plains*.

war with the main personality, is neither strong enough nor important enough to become the nucleus of a secondary personality. In this case the complex has to be repressed; that is to say, it is prevented from directly determining experience and behaviour, and thus fulfilling the normal function of any disposition in the mental structure. If it were allowed to determine experience the subject would continue to be aware of the conflict and to suffer that mental pain which, as we have seen, he has a strong tendency to avoid. Repression of a complex provides at least a provisional solution of the difficulty. The repressing force is, of course, the main personality.

Freud describes the facts in a picturesque fashion, comparing the unconscious to a large anteroom, adjoining which is a smaller reception-room, the preconscious system. Crowding the anteroom are all sorts of mental excitations eager to get into the reception-chamber, where possibly they may succeed in attracting the eye of Consciousness, the presiding deity of the preconscious system. But guarding the door between the two rooms is the censor, a sort of Cerberus, whose function is to examine all applications for admission to the preconscious and refuse all those that do not meet with his approval. Those excitations that are forced to remain in the unconscious are therefore repressed; that is to say, they are incapable of becoming conscious in their proper form. If, however, they suitably disguise themselves they may elude the vigilance of the censor and gain an entrance into the preconscious. Thus the Freudian unconscious is a part of the mind full of ideas that cannot be admitted to consciousness on their own merits.

Like all metaphors, the conceptions of the two chambers, their inhabitants, and the censor may mislead us if we allow them to become our masters rather than our servants. Regarded as hypotheses about the mind, they certainly seem less probable than the notions of mental structure, experience, engram-complexes, and the self-regarding sentiment, which we have assumed throughout our study. If, however, we accept them as crude but useful metaphors no harm need be done; and it is only fair to add that the Freudian theory of the mind has proved eminently workable in practice.

Using our own hypotheses, we must emphasize the fact that the repressed complex is still an active part of the mind, a centre of psychic energy which is not being expended in determining experience. Part of the energy of the integrated personality has to be spent in keeping such a complex repressed, and this energy, too, is not therefore available for thought and action. The unity of the mind is destroyed: we may compare it with a country that has a refractory province to keep in order. The complex, instead of being synthesized with the main personality, is isolated; but it must find some means of discharging its pent-up energy. It may succeed in determining experiences that will not readily bring the conflict up to the level of awareness; such experiences have an air of innocence and do not reveal their true origin. Thus many elements of our experience are substitutes for others which, if they were allowed to come into being, would cause a painful conflict in the conscious mind. Incessant washing of the hands, for example, may be a symbolic cleansing—a substitute for memories that would bring with them an unbearable sense of shame and guilt. The classical instances are, of course, Pilate and Lady Macbeth.

We have such symbols abundantly manifested in dreams. In many dreams, it is true, there is little or no symbolism. The censor is off his guard, and the element of guilt is eliminated; the repressed complexes, therefore, get a better chance than usual of determining conscious desires that are crude and undisguised. Such dreams shock our moral sense if we remember them when we are awake. But we have a strong tendency to forget dreams, and we may safely infer that the dreams that are difficult to remember are just those which would tend to cause conflict if we could recall them. In other dreams, however, the usual waking inhibitions are active up to a point; the repressed complexes have still to disguise themselves and find expression in symbols. The psycho-analysts tell us that many dream-symbols are common to all mankind: thus, for example, a king in a dream signifies the father. Excellent instances of such symbolism are to be found in the dream of Joseph, where the sun, moon, and stars signified respectively the father, mother, and brothers of the dreamer.

The labours of Freud, Jung, and their followers have shed much light on dreams, and have amply confirmed the ancient belief that an intelligible meaning can be supplied by a skilled interpreter. We must resist the temptation to follow their fascinating inquiries here. The common fear-dream, however, is of some importance to us, since it occurs frequently during childhood and adolescence. In such a dream we experience extreme terror, and wake up not knowing the object of our fear. This vague fear, we are told, is really a fear that the repressed complex is about to burst into the expression of which the main personality so violently disapproves, and this is prevented by the subject waking up in time. The falling-dream admits of a similar explanation, the physical falling being a symbol for the fall in self-respect that would take place if the repressed elements had their way. We certainly always waken before we reach the foot of the precipice, thus anticipating and preventing the fall.

Somnambulism is a dream in action, and is always a sign of mental conflict. Again the main personality—the repressing force—has abdicated, and the repressed elements have their chance of determining experience and action. The sleep-walker, therefore, since he is under the sway of a repressed part of his personality, can remember nothing of his somnambulist experiences when he awakes.

Other manifestations of repressions are to be found in the little tricks and mannerisms which cannot be justified by reason, and which are usually mere symbols for something else. Such automatisms may vary from simple little habits to highly complicated activities. Stammering, too, is usually a sign of mental conflict, and has been traced, in some cases at least, to a repressed fear of the father; while left-handedness, we are told, may also be a sign of hostility toward the father, expressing the child's desire to be different. Adolescence furnishes the last practicable opportunity for discovering the repressed tendencies behind such idiosyncrasies and organizing them in the main personality.

Endopsychic conflict sometimes shows itself in a state of perpetual worry, which may be merely vague or directed in

some definite direction, but which is always contrary to reason. Again, the subject may have specific, morbid fears of certain objects or situations—of closed or open spaces or sharp knives, for example. Such fears, always disguised for something else, can only be traced to their source by psycho-analysis.

It is a favourite doctrine of the Freudian school that slips, accidents, and omissions do not really take place by chance, but are rather manifestations of conflict in the unconscious. Accidents frequently happen when we are taking the greatest care: an article slips from our fingers, a blot appears on a letter that we are writing, we say the wrong thing, and write what we do not intend. Such occurrences, apparently trivial, have their origin in the unconscious. They are actions which the censor allows the repressed complexes to determine—disguised realizations of hidden impulses. It is the repressed complex which, as it were, jogs our elbow and causes us to drop the article or make the blot. Persistent spoiling of exercise-books in school, for example, may be a sign of a child's unconscious attitude of rebellion against the orderliness of school and the autocracy of the teacher; while mistakes in 'polite' letters may easily reveal our unconscious hypocrisy to ourselves.

What is usually called 'Freudian' or 'active' forgetting has a similar explanation. We forget to write important letters and to post them when written; we forget names and engagements in the face of strong conscious desires to remember them. The things we forget in this way are those of which the remembering would be unpleasant, or would lead, sometimes in a roundabout way, to unpleasant feelings. A boy who persistently forgets to do his work, or to bring it to school when done, is not necessarily careless or perverse. A repressed part of his mental content probably resents his having to perform the task at all.

Repressions may be suspected also when a person shows excessive and unreasonable zeal in any one direction. Such zeal, we are told by the psycho-analysts, is a 'defence mechanism' or 'reaction formation' with which the main personality has to fortify itself in order to keep its exact opposite

firmly repressed in the unconscious. Thus excessive prudery may indicate a morbid, repressed interest in sexual matters; exaggerated cleanliness a hidden sense of guilt; while the rash undertaking of work which, in quality and quantity, is beyond the capacity of the individual may well be a reaction from a repressed sense of inferiority. Again, intolerance of certain faults in others is frequently an unconscious defence against the urge of repressed tendencies to similar faults in ourselves. Our conscious interests, too, are frequently compensations for instincts that are denied direct expression in our daily lives.

It is important that the educator should understand these theories of endopsychic conflict and repression, for they, more than any other psychological doctrine, help him in the understanding and treatment of the difficult child and the adolescent. The adolescent, indeed, is normally in a state of mental conflict, to which source his frequently unsatisfactory behaviour can always be traced.

One of the main problems confronting the adolescent is, as we have seen, the readjusting of himself to the outer world. Since this is a difficult business, we cannot be surprised that he should tend to be an introvert; that is to say, to be pre-occupied with his own inner mental life rather than with things outside himself. An introvert finds it difficult to direct his psychic energy outward and make a success of life; and he naturally gets a distorted view of the external world. The introverted adolescent, then, indulges in day-dreams which provide a pleasant world of make-believe for him to live in. He frequently wants to lie in bed, complaining of lassitude and fatigue, or of some imaginary illness; but these, as often as not, are expressions of unconscious wishes to retire from the battle altogether and avoid facing real life. Rest is no cure for such fatigue, for it merely aggravates the trouble. We must rather seek to induce such an adolescent, by all the means in our power, to take part in activities outside himself. Games are an excellent remedy in mild cases, for the trouble frequently disappears when the youth finds that such occupations are enjoyable means of self-expression. In more serious

cases skilled psychological treatment is urgently required, for the final result may be that form of insanity called *dementia præcox*.

Day-dreams always tend to be regressive; that is to say, they tend to hark back to earlier stages of development at which the individual was better adjusted than he is at present. The attainment of a new level of emotional organization always entails considerable effort; there is a strong conservative tendency to cling to old levels and an unwillingness to exchange them for new ones which may give less pleasure. The danger of becoming 'fixated' at any one stage of development is considerable. Parents may easily hinder rather than help their children to achieve mental maturity if they jealously try to keep the affections of the growing youth or maiden directed exclusively toward themselves, and object to their having 'minds of their own.' Keen teachers, too, must beware; for, in their anxiety to do everything possible for their pupils, they may easily be doing too much, thus encouraging an attitude of dependence which may become a fixation.

Extreme moodiness in an adolescent is also a sure sign of conflict within. His frequent gloom, which he himself understands less than anyone, may well be due to his breaking away from the earlier emotional ties of which he is unconscious. His irritability may be regarded as a projection on the external world of his dissatisfaction with himself, and should be sympathetically dealt with.

While it would be an exaggeration to say that there is a natural tendency toward lawlessness in adolescence, it is certainly true that this period of life marks the beginning of most vicious careers. Before the days of the 'new' psychology it was usual to attribute adolescent misdemeanours to an overdose of original sin. Now, however, our understanding of emotional conflict enables us to be more sympathetic and helpful. It is generally agreed that delinquency is due to a failure in adjustment: the individual reverts to the moral standards of early childhood, and his repressed instinctive urges are side-tracked into anti-social practices. The power-

ful sex-instinct is probably responsible for most crimes; it leads not only to sexual offences, but to others, not overtly sexual, which are displacements of this primitive urge. Anti-social conduct, too, is a ready means of discharging the energy of a thwarted self-assertive instinct in a show of independence and power, society at large being, in the last resort, a father-substitute.

Our confidence that mental conflict is the main cause of the trouble is increased by the certainty that many adolescent delinquents do not know why they commit their crimes. They seem to have a compulsion to act as they do, and reason is powerless to stop them. No doubt there are innate moral defectives whose very nature does not allow them to effect a synthesis of the personality; but there can be no reasonable doubt that the bulk of adolescent crime is due to normal tendencies that have got out of gear in the actual development of the individual. And while it is true to say that many criminals are mentally defective, it would be wrong to infer that mental deficiency is the cause of crime. Poverty of intellect merely gives the delinquent less power to inhibit the impulses that are more or less common to all.

The delinquencies of adolescence assume various forms, not all of which call for the self-protective action of society. One mild delinquency, which concerns the home or the school rather than the wider society, is the wandering mania. The truant may be quite aware of a strong desire to escape from parental authority; but when he cannot explain his action we must invoke as explanation either an unconscious conflict between his urge for independence and his desire to remain snugly under the protection of his parents, or an unconscious state of revolt against the father.

Lying is another misdemeanour which causes great concern to the educator. The ordinary lie is, of course, a conscious perversion of truth, and is told in order to avoid punishment or to get out of difficulties; but it would be a mistake to assume that all untruthfulness is of this nature and to treat it accordingly. Much of it, being due to mental conflict, is a disease of the mind rather than a moral fault. The 'white

lies' of childhood are due to exuberant imagination, coupled with the inability to distinguish clearly between the worlds of fantasy and reality; and the same explanation may justly be fitted to the untruths told by the adolescent, who is living in a state of perpetual day-dreaming. Morbid lying is always due to endopsychic conflict, and its form usually gives a clue to the nature of the repressed complexes. Thus dramatic lies, designed to produce a striking effect and magnify the importance of the individual, are an expression of a thwarted self-assertive instinct. Such liars really believe their lies, and, in the frequent telling of them, realize their unconscious wishes.¹

No authorities of educational institutions escape having to deal, at one time or another, with cases of theft, and they are always tempted to purge the atmosphere of the school-society by getting rid of the offender. But can a conscientious educator ever be satisfied with a course that sends a badly adjusted individual into the world, unreformed and uncured? Stealing, when it is for a more or less conscious object, is, of course, the acquisitive instinct in action. We can realize how difficult it is absolutely to sublimate this instinct when we reflect that otherwise highly moral people think it no crime to keep borrowed books, to defraud railway companies, and to dodge income-tax. Stealing, however, is frequently more than mere acquisition, being due perhaps to unconscious attitudes of rebellion toward parents transferred to society in general, perhaps to a repression of the sex-instinct. Many stolen articles have, for the offender, a symbolic sexual significance which can be discovered only by psycho-analysis. In general, it seems true to say that acquisition comes on the scene in place of other instincts that are thwarted. Why should this be so? Dr Burt suggests that it is because the thwarted impulses cannot find their objects, and acquisition is the equipment Nature has given us for procuring what we need but have not got. Remembering that the instincts are not separate mechanisms in the mind, but branches from a common stem of hormone, we can readily believe that there is a

¹ Cf. the immortal Mrs Gamp in *Martin Chuzzlewit*.

transference of energy from one instinctive channel to another, and that acquisition will naturally become active under such circumstances. When made active it will seek its natural goal, seizing upon anything within reach.

Adolescents frequently organize themselves into hooligan gangs whose supreme object in life seems to be war against the community in general. It has been found that such gangs are amenable to persuasion and sympathetic treatment, and that it is possible to redirect the energy expended in this way into channels of useful social service. A well-organized school-society will do all that is needed to sublimate such tendencies.

These few examples may serve to expound and illustrate our conviction that most of adolescent delinquency is due to unconscious mental conflict. The corollary of such a view is that the cure is a resolution of the conflict, a sublimation of the repressed impulses, and a reintegration of the personality. Punishment is worse than useless, for it merely serves to intensify the adolescent's conscious or unconscious hostility to society in general, and to individual representatives of law and order in particular. The dangers of repressive education are obvious when we realize that teachers are parent-substitutes and may easily be the objects of the adolescent's unconscious resentment. If educators would understand that the highly inconvenient forms of behaviour which we have been discussing cannot be dealt with by assuming that they are rational, and by browbeating the offender into giving false reasons, much good might result. We all have a tendency to rationalize our motives, to give reasons for behaviour of whose true origin we are really unaware. The psychology of the unconscious has taught us convincingly that the mainsprings of behaviour are not to be found in reason, but in the emotional dispositions, sometimes organized with the main personality, sometimes isolated. Treatment of delinquencies must be based on this knowledge. It is not suggested that the teacher should establish a psychological clinic in the school, and undertake the duties of psycho-analyst in addition to his ordinary work; but he can do much by an intelligent application of

his limited knowledge, and can hand over desperate cases to the skilled psychologist, who will surely at no distant date be an official in every area of educational administration. Problems of adolescent behaviour can no longer be shelved, or treated without understanding, if the new advance in education is to succeed in transforming our society into something purer, freer, and nobler.

SUGGESTIONS FOR FURTHER READING

The works of Freud, Jung, and the other psycho-analysts.

HART : *The Psychology of Insanity*.

TANSLEY : *The New Psychology*.

HINGLEY : *Psycho-analysis*.

CRICHTON-MILLER : *The New Psychology and the Teacher*.

HADFIELD : *Psychology and Morals*.

LOW : *The Unconscious in Action*.

REES : *The Health of the Mind*.

READ : *The Struggles of Male Adolescence*.

FLÜGEL : *The Psycho-analytic Study of the Family*.

GREEN : *Psychoanalysis in the Classroom ; The Daydream ; The Mind in Action*.

BURT : *The Young Delinquent*.

McDOUGALL : *An Outline of Abnormal Psychology*.

CHAPTER X

ATTENTION AND INTEREST

It will hardly be denied that the problem of obtaining attention is of the first importance to every teacher. One can easily imagine a perfect piece of exposition which is utterly ineffective simply because the pupils are not attending. Within limits, at least, it is better to teach by a faulty method with the pupils attending than to offer a model of clearness and lucidity when their thoughts are elsewhere. The tremendous importance of attention is due to the fact that it is involved in all mental activity; the mind, if it is active, must be attending to something. Now we all know well what it is to attend; but if we are to be able to capture and direct the attention of our pupils at will we must think out the problem of attention, relating it to our general doctrine. A little understanding will be worth a whole host of precepts.

At one time attention was believed to be a faculty or power of the mind which could be directed to any object and which was capable of being trained. But clearly there is no such thing as attention taken by itself: attention exists only when some one is attending to something. It is, therefore, better to say "I attend to my work" than "My attention is directed to my work." Attention, like emotion, is an activity of the person attending; it is the name by which we describe a particular mode of experience, and, apart from the subject and object of attention, it is nothing at all.

The older psychologists took an intellectual view of attention, emphasizing solely its cognitive aspect. Thus they described it, aptly enough, as a focusing of consciousness on an idea, or object of thought. Now, when we focus our eyes on anything we see it clearly; we see other objects that are near it less clearly, and objects that are farther away less clearly still; finally, there are objects which we see merely

'out of the corner of our eye.' As it is with the field of vision, so it is with the field of consciousness: the object of attention is clear, other presentations are less clear, while there are objects of thought that are merely "on the margin of consciousness." Thus attention is a process of getting an object of thought clearly before the mind. Just as, with a camera, we can make a blurred image clearer by focusing, so by focusing our consciousness on an idea we get to know that idea better. To use another metaphor, in the attention-experience the stream of consciousness slows down, and the object of attention becomes more fixed and stable. Clearness, then, is the result of attention: quoting Titchener, we may say that "the problem of attention centres in the fact of sensible clearness."

Now the above view of attention is important, and its truth cannot be denied. One feels, however, that it misses the main point, for it fails to answer the question, "Why do we attend at all?" Where does the drive in the attentive process come from? It comes from the supremely important emotional and conative factors which are entirely neglected in the intellective account. Mere comprehension and clearness are not enough, for in any true process of attention the mind becomes active and wants to do something; and the good teacher, aiming at more than understanding, wishes to initiate and guide this mental activity. These affective-conative aspects of attention are now amply recognized by modern psychologists. We have McDougall defining attention as a "striving to cognize," or, more fully, "Attention is merely conation or striving considered from the point of view of its effects on cognitive process."¹ Far from being an intellective 'faculty' of the mind, it is a particular kind of striving. The stronger the conation, the more intense the attention.

We have seen that every striving experience involves the activity of some conative disposition in the mental structure; in attention, therefore, some disposition must be active—in other words, some reservoir of mental energy must be opened. The consideration of these conative dispositions will enable us

¹ *An Outline of Psychology*, pp. 271, 272.

to offer an answer to the question, "To what objects do we attend?"

Attention is, perhaps, the most important manifestation of the general power of selection, which Drever has distinguished as one of the three main characteristics of the psychical. What is it that determines the selection of one thing rather than another as the object of attention? It is often said that sense-impressions are selected on account of their intensity or suddenness; we readily attend, for example, to a flash of lightning or to the noise made by something falling. But this does not get to the root of the matter, for if we are really absorbed in a task we may go on attending to it while a continued loud noise is affecting our ears. The real reason why such things are peculiarly apt to become objects of attention is not so much that they are intense or sudden as that they readily excite in us wonder or fear: in other words, to use McDougall's familiar metaphor, they are keys that fit the locks of instinctive dispositions. In man, at least, these natural excitants of instincts need not necessarily be sense-impressions: they may equally well be memory-images or ideas. When we cannot sleep we can discover, by a little introspection, that we are attending to something that is exciting an instinctive disposition. Now we attend to such objects because they matter intensely to us—in other words, because we are interested in them; and the things that matter most to us are the objects that awaken our instincts. So it is our instincts, in the first instance, that select for us our objects of attention.

We have just used, almost inadvertently, the word 'interested.' Before we can proceed to bring out the close connexion between interest and attention we must try to clear up the meaning of this somewhat over-used word. At least three meanings may be distinguished.

It is useful to remember the derivation of the word. In Latin the word 'interest' means 'it matters,' or 'it concerns.' Now a thing that interests us is just something that concerns us or matters to us. We may, if we please, say that a person's interests are those objects of his experience that matter to him. If we do so we give the word an objective meaning, using it

to denote something outside the person who is interested, or rather a psychical object arising from something outside him. For example, if we say that a man is interested in photography we mean that photography matters to him; and we can and do say that photography is one of his main interests.

But we might also use the word 'interest' to describe the experience of the person while he is absorbed in his photography. Here interest is the mode of experience of the individual, and bears a subjective meaning. This way of using the word has the sanction of more than one eminent psychologist; thus Stout uses it as a comprehensive term to denote the affective-conative aspects of experience; while Drever uses the compound word 'instinct-interest' to denote the fundamental affective aspect of all experience.

If, however, we use the word to describe a particular kind of experience, which is here now and away the next minute, we surely imply that a person ceases to be interested in a thing when he no longer thinks of it. This does not square with the facts. Our photographer, we are certain, retains his interest in photography when he is thinking about something else. "Being interested is, then, an enduring condition of the subject."¹ As we have seen already more than once, we have to invoke our hypothesis of mental structure to account for the permanent aspects of mental life; and here we must say that the permanent condition of being interested, say in photography, implies the possession of a disposition in the mental structure organized round about the idea of photography. In order, then, to do justice to the relative permanence of interest, we may, without doing violence to other meanings, say that the interest is this disposition, giving the word a structural meaning. Thus Drever in another place says, "An interest is a disposition in its dynamic aspect."²

The above, in the opinion of the present writer, is the most useful and accurate meaning with which to invest the word 'interest.' Instead of using the word itself to denote the thing in which one is interested, we should do better to talk of an

¹ McDougall, *An Outline of Psychology*, p. 274.

² *Introduction to the Psychology of Education*, p. 126.

'object of interest'; and, as we shall see, instead of calling the experience the interest, we can more properly talk of an attentive process, or a condition of paying attention.

The fundamental interests of the human being, therefore, are the instincts themselves, those inherited structural dispositions which determine their possessor to perceive and pay attention to certain objects. But besides those innate structures, we have the more complex, acquired dispositions which we call sentiments; and the idea round which a sentiment is organized is an acquired object of interest. To say that a man is interested in photography is merely another way of saying that he has a sentiment for photography, the sentiment itself being an acquired interest. This brings out the important point that mere knowledge of a subject does not necessarily imply a direct interest in it. Interest is conative rather than cognitive; the emotions must be organized round the idea of the object of interest. It is true, of course, that the possession of a sentiment impels a man to acquire knowledge about its object; but, at the same time, many people acquire knowledge about things in which they have no direct interest.

We are now in a position to see the very intimate connexion between attention and interest. They are merely different ways of looking at the same thing, like the two sides of a coin. The fact underlying both is an organized disposition in the mental structure. We use the word 'interest' for the structure itself, while we use the word 'attention' to describe the experience which that structure is always ready to determine—the experience of thinking of certain objects and of being active in relation to them. "To have an interest in any object is, then, to be ready to pay attention to it";¹ while attention always implies the activity of some mental structure. "Interest is latent attention; and attention is interest in action."¹ "Attention is interest determining cognitive process."²

So far we have been considering only the attention that is governed by instincts or sentiments. Such attention, since it needs no effort of will to sustain it, may properly be called

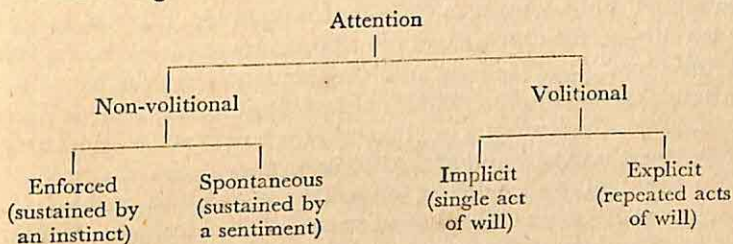
¹ McDougall, *An Outline of Psychology*, p. 277.

² Stout, *The Groundwork of Psychology*, p. 48.

'non-volitional'; this is a better word than 'involuntary,' because, in popular speech, we might well call this kind of attention 'voluntary.' Attention determined by an instinct might well be called instinctive, but it is usual to call it enforced non-volitional attention; while attention which has as its motive power an acquired interest or sentiment is described as spontaneous non-volitional attention. But the thoughtful reader will doubtless have noted that nothing yet has been said about attention sustained by the will. We can and do attend to objects which are not in themselves the objects of instincts or sentiments, and, in order to initiate and sustain such attention, we have to bring the will to bear on the situation. At first sight this volitional attention might seem to spoil the beautiful simplicity of the doctrine of the intimate connexion between interest and attention, which we have been arguing; but if we maintain the structural meaning of the word 'interest' this need not be so. A student, it is true, by an effort of will may attend to a subject of study that has no attraction for him, that does not evoke the activity of any particular instinct or sentiment. It would appear, however, that in some way or other such a subject does matter to him—in other words, that it is an indirect object of interest. It matters to him, perhaps, because it is necessary for an examination which he wishes to pass; perhaps because it will further the career he has chosen; or perhaps because, in order to save his self-respect, he will not allow himself to be beaten by it.

But what is this 'will' that he brings to bear on the situation? It is, as we have seen, the activity of the whole organized self. The dynamic that sustains a willed action is neither an instinct nor a sentiment, but the integrated personality. The interest, then, which lies behind volitional attention is not this or that instinct or sentiment, but the master-sentiment itself, the most comprehensive disposition and therefore the most inclusive interest that we possess. Volitional attention does not break down the dictum that "attention is interest in action," but rather confirms it, the interest in action being the sentiment of self-regard or self-respect.

Volitional attention is frequently sub-divided into two classes. There is that kind of volitional attention which, initiated by a single act of volition, can be sustained for a long time; and there is the kind that needs many repeated acts of volition to carry it on. These are labelled 'implicit volitional' and 'explicit volitional' respectively. Thus we may draw up the following table:



We may now profitably consider the question of interest and attention in the school. No one has even doubted that the pupil must be attentive, but it is only in comparatively recent times that it has been proclaimed that he must also be interested. This modern doctrine of interest in education has been sharply criticized as leading to 'soft pedagogics': teachers have been told that, by making everything interesting, they are warping the moral fibre of their pupils and failing to prepare them for serious adult life. But, if we are correct in our argument that behind all attention there must be interest, then the critics of the doctrine of interest must be wrong. The trouble would seem to spring from the habit of confounding 'interest' with 'amusement' or 'pleasure.' No one would deny that the dentist's chair is an interesting place, but few would say that it is pleasant. An object of interest, let us repeat, is something that matters to us or concerns us. Pleasantness and unpleasantness are side-issues in the matter, for a pleasurable feeling comes only as a by-product when our interests are successfully reaching out toward their goals. The critics—and probably many teachers themselves—need to enlarge their conception of what is meant by interest in education. Interest is an active disposition: it may be an

instinct, a sentiment, or even the whole of the organized self. In the last case we have the will sustaining attention to a matter that is neither pleasant nor amusing, and the critic ought to be satisfied. We may steadily maintain the doctrine of interest if we recognize that volitional attention too is sustained by interest, the governing interest being the self-regarding sentiment. We ought to face a certain amount of drudgery in school, but we must make it matter to the pupil. At times the only motive that we can offer him is the saving of his own self-respect; but, we may add, the incidental satisfaction that attends the conquering of difficulties is not to be despised. We gladly concede a point to the critic who preaches the hard doctrine that the pupil should have to face much that is distasteful, thereby exercising his will; but we are entitled to point out that, in following his excellent advice, we are not departing from the equally strenuous doctrine of interest.

All the different levels of attention have a place in educational method. Clearly, instinctive attention must be exploited at the beginnings of education, for the pupil as yet has no sentiments or self-regarding sentiment to which appeal can be made. The teacher of infants must use crude curiosity, crude self-assertion, and other instincts in order to command attention and get on with the work of instruction. But the wise teacher will recognize that here she is dealing only with raw material, and that these primitive modes of attention must eventually be superseded by higher forms. Teachers of older pupils will do well to avoid all startling methods. Acting the clown or banging the desk will certainly attract attention, but the attention so stimulated will be unfruitful so far as work is concerned.

Sentiment-interest and spontaneous non-volitional attention are of the utmost importance in intellectual education. To begin with, a teacher of insight will use the sentiments that are already there, and appeal to the hobbies of his pupils, skilfully weaving his instruction round these strong interests. But his task does not end there; he must build up and foster sentiments of love for the various subjects of study themselves. A teacher of mathematics, for example, will seek to engender

in his pupil a love for mathematics, getting him to look on his work not as a task, but as an enjoyable intellectual pursuit. Such a teacher will aim at training young mathematicians who have the true mathematical spirit, rather than young parrots who can merely pass examinations. For fruitful intellectual work spontaneous non-volitional attention is the highest form of attention possible. When such sentiments are built up the pupil will take his own education in hand, looking on his teacher no longer as a taskmaster, but as a friend and guide who will help him in his researches. It is this type of interest and attention, indeed, that constitutes the true spirit of research.

Some will say that the above is a counsel of perfection. It certainly is an ideal to be aimed at—the goal rather than the process of most intellectual education. We must fall back on volitional attention in much of our work, encouraging our pupils by all the means at our disposal to apply themselves to their studies. We must foster their self-respect and urge them not to be beaten by difficulties. But, clearly, attention that is sustained by the will cannot compete with the attention which has direct interest behind it, and the intellectual results achieved will not be so good. When we go beyond the question of intellectual education, however, and think of character-training, the case is different. Here volitional attention is of great importance. One cannot doubt the value of training a pupil to give his attention to matters that are not intrinsically interesting. The will is trained primarily by being exercised, and one field in which this exercise can profitably be made is certainly the field of intellectual effort.

Experimental psychologists have devoted much labour to the investigation of the subject of attention, and their findings are of great importance. For a full account the student is recommended to consult books on experimental psychology and education, but he may find it convenient to have the main results summarized here.

As a result of extensive work on the subject, Professor Spearman has formulated an important quantitative law, which he calls the "law of span." "Every mind tends to keep its total

simultaneous cognitive output constant in quantity, however varying in quality.”¹ He takes the view that the mental energy of any individual is limited in amount, and that if it is being expended in one direction it cannot be expended in another. The law will be seen to be exemplified in the following paragraphs.

Experimenters have sought to determine the range or span of visual attention, using the tachistoscope—a piece of apparatus designed to expose objects for a brief space of time. A subject is given a momentary glance at an irregular group of dots or letters, and is required to tell how many he has observed. It has been found that adults, at a single glance, can apprehend five or six irregular dots; but more if the dots are arranged in patterns, as on playing-cards. Certainly, in the latter case, the subject takes in the pattern first, subsequent analysis revealing the number of dots; and the question arises whether the subject does not always do this. The mind has a general tendency to apprehend complex wholes, analysing them later into their constituents. Here there is some evidence that the person attending does apprehend the whole pattern as it is exposed, counting the dots by means of a memory-image; for it has been found that subjects with persistent memory-images have a large span of attention. The question of the number of objects that can be apprehended in one act of attention really depends on whether they are disparate, or constituents of a single whole, exhibiting “unity in diversity.”

Experiments on the span of auditory attention have been performed, a rapid succession of identical sounds, such as beats of a metronome, being presented to the subject. It is found that adults apprehend eight such sounds.

The question of continuity of attention has been investigated. For how long do we continue to attend? We talk of attending to a task for hours on end, but this cannot mean that we have one object at the focus of consciousness all the time. In experiments on this point subjects are given a very faint visual or auditory stimulus, and are required to indicate to

¹ *The Nature of ‘Intelligence’ and the Principles of Cognition*, p. 131.

the experimenter when their attention to it ceases or is resumed. It is found, with most subjects, that attention lapses every five or six seconds. Thus we attend to a task not continuously, but in spurts.

Another problem which psychologists have tried to solve experimentally is whether we can attend to two or more things at once. To be able to do so is obviously a valuable asset to the teacher, who has usually to divide his attention between his actual lesson and the behaviour of his pupils. Division of attention is investigated by requiring a subject to perform each of two or more tasks separately, estimating his performance at each in a given time; then requiring him to perform them simultaneously, again estimating performance. Convenient tasks for this purpose are sorting playing-cards into suits and continuing a series of numbers in arithmetical progression—for example, 29, 33, 37, . . . It is found, as we should expect, that in the simultaneous performance both tasks suffer; and we have here a very clear instance of the law of span. The mental energy, instead of flowing in one channel, is flowing in two, and the supply available for each is less. When one of the tasks is nearly automatic, however, such as tapping at maximum speed, the performance does not suffer much when it is combined with something else; perhaps very little mental energy is required for such a task. In these experiments on division of attention the introspection of the subject reveals an interesting and important point—namely, that attention fluctuates from the one task to the other. We will to attend to one of the tasks, and are able to continue it automatically for a little time, while we attend to the other. Thus we do not really attend to two things at once; there is a more or less rapid alternation of the two at the focus of consciousness.

We have here an example of McDougall's important dictum that "conation outlasts the cognition which initiates it."¹ It is a familiar experience to intend doing something and to forget what that something is. We have an experience of conation or striving, but the object of striving has gone from

¹ *An Outline of Psychology*, p. 282.

us. For example, we may rise from a chair to fetch a book from the bookcase, and have to return to the chair to discover what it was we meant to do. McDougall tells us that he has learned to trust an uneasy feeling that he ought to be doing something: it is, he says, a sure indication that something has been forgotten.

When the effect of distraction is investigated a paradoxical result is usually obtained. The subject is required to attend to some task, and efforts are made to distract him; frequently, however, the disturbance puts him on his mettle; he 'rises to the occasion,' and gives a better performance than when undisturbed. The explanation of this result is not far to seek; the subject makes an effort of will which more than compensates for the unfavourable conditions. People who are accustomed to working in a noise sometimes find that when the disturbance is absent they cannot make the necessary effort. It is probable, however, that fatigue supervenes more readily in work under distracting conditions. The results of such experiments might seem, at first sight, to contradict the law of span; but this is unlikely. The energy expended by the subject does not exceed the maximum of which he is capable: he merely calls up his reserves.

Experimental work has disclosed types of attention; different individuals habitually attend in differing ways. Some people spread their attention, probably by jerks, over a variety of objects, while others concentrate on one only; the former are said to belong to the distributive, the latter to the intensive type. It seems to follow from the law of span that if a person attends to many things he cannot be attending as intensively as if he were attending to one only. But does it follow that a person of the distributive type is incapable of intensive attention? He probably, as we have seen, does not really attend to several objects at the same moment, but to one after another in rapid succession; thus his attention to each may be quite intense while it lasts. In any case, he need not merit the name of dilettante. And certainly it does not follow that if a subject cannot attend intensively he must be able to attend distributively, for it is just as likely that he may be lacking in

mental energy. But these types do exist, and there is evidence that the educator is powerless to alter them. Clearly, different spheres of usefulness are open to the two types. A person of the intensive type, for example, may succeed in deep scientific research, but the achievements of a distributive in this field would be likely to be scanty. Probably all great scientists belong to the intensive type. On the other hand, the complexity of modern business would seem to call for a distributive rather than an intensive type. It is clear that children of the two types will naturally adopt different modes of working; and the solution of this problem, as of similar practical problems, lies in the adoption of a large measure of individual work.

A similar, though not an identical, distinction is between the fixating and fluctuating types. Fixators attend carefully and perceive only what is there; their reports are characterized by objective fidelity. Fluctuators, on the other hand, tend to embroider the object of attention with the figments of their own imaginations, and report what they thought they saw, or expected to see. These two types are seen clearly in the teaching of reading. Some pupils read accurately, fixating what they actually see; while others make guesses at words, judging them by their general appearance.

The distinction between dynamic and static types appears to correspond to that between explicit and implicit volitional attention, already noted. Those who attend dynamically need to remind themselves continually to attend; while those of the static type make an effort at the beginning and steadily give their attention to the task. This difference may well be innate.

Many physiological accompaniments of the attention-process have been noted, both in the posture of the body and in more subtle internal changes. They need not detain us here. Every teacher of experience knows the signs of attention in his pupils' faces and in the posture of their bodies. Teachers of young children are familiar with the facial contortions and the bodily attitudes which tend to accompany a process of concentration: they are charmingly portrayed in a

well-known picture, *The Writing Lesson*. Such unnecessary movements of the body are eliminated as the young pupil acquires skill.

Certain broad distinctions between the attention of children and that of adults may be made; but the principle of interest holds throughout. Children attend to objects they can see and hear rather than to abstract ideas, simply because they are more interested in such objects. The practical corollary is that we should employ actual objects and pictures in our lessons to young children and avoid a mere stream of talk: words are the vehicle of ideas, and a more concrete appeal is required. Again, the interests of a child are his instincts rather than his sentiments, and his sentiments rather than his self-regarding sentiment; thus we are not surprised to find that the child's attention is governed by his instincts, such as curiosity and self-assertion, rather than by sentiments or the will. And when we do succeed in inducing him to attend volitionally we find that his attention is dynamic rather than static.

All the foregoing considerations should help the young teacher in the all-important task of capturing and holding attention. He must ever appeal to an interest—an instinct, a sentiment, or the self, according to his pupil's stage of development. His chief aid to begin with is the instinct of curiosity; here he must not refuse the aid of stimuli that are striking and novel. Later on he should seek to weave his teaching round the hobbies and other acquired interests of his pupils; where he cannot do that he may frequently draw his illustrations from such interests. He can show, too, that his lessons will help to solve problems in which pupils are interested; that they will develop a new power that is desirable. It is better to make the purpose of the lesson clear at the beginning than to keep children guessing what it is all about. Lastly, volitional attention and character-training go hand in hand; and success in obtaining volitional attention is proportional to success in the wider task of training character.

SUGGESTIONS FOR FURTHER READING

STOUT : *A Manual of Psychology*, chapter ii; *The Groundwork of Psychology*, chapter vi.

JAMES : *The Principles of Psychology*, chapter xi.

MCDUGALL : *An Outline of Psychology*, chapter ix.

RUSK : *Experimental Education*, chapter iv.

COLLINS and DREVER : *Experimental Psychology*, chapter vii.

SPEARMAN : *The Nature of 'Intelligence' and the Principles of Cognition*, chapter xi.

ADAMS : *Primer on Teaching*, chapter iii.

CHAPTER XI

MEMORY

"COGNITIVE events by occurring establish dispositions which facilitate their recurrence." In these words Professor Spearman¹ states the basic law of memory. We have already discussed mneme, or the mind's general power to conserve the after-effects of its own activity; and have seen that all our present experiences are coloured by and have reference to past experiences which have left behind them dispositions or engrams in the mental structure. It is in terms of this hypothesis of dispositions that we seek an explanation of our power to remember past events.

The term 'memory,' in the strict sense, is narrower than the term 'mneme': it is mneme risen to the level of apprehension. All our experiences have a mnemonic basis, but not all are memory. In memory "that reference to the past which is implicit in all mental activity is more explicit and more prominent than in other acts."² The subject must apprehend the relation between the present experience and a prior one; that is to say, an experience is memory only if it is experienced as a memory. It is certainly fallacious to assume that the previous experience has gone into cold storage in the interval and re-emerged intact. A memory is a new experience determined by the dispositions laid down by a previous experience, the relation between the two being clearly apprehended.

It is only in certain favourable cases that the dispositions laid down by experiences are able to determine memories. Failure to remember, however, does not prove that dispositions have not been laid down, or that they are not active. For example, we might fail to recall, or even to recognize, a series

¹ *The Abilities of Man*, p. 271.

² McDougall, *An Outline of Psychology*, p. 309.

of nonsense-syllables that we had once learned ; but we should certainly find, if we tried, that fewer repetitions were required to relearn the series, thus proving the existence and activity of dispositions resulting from the first learning. Here there is nothing that could be called memory. If, however, on the later occasion we recognized the series as the one we learned before, our experience would come under the heading of memory. Recognition is the first manifestation of mneme that we can call memory, for in it we have that explicit reference to the past which we have seen to be necessary. Implicit reference to the past is insufficient. For example, a puppy at whom stones have been thrown need not be supposed to recognize on a future occasion the boys who stoned him: his behaviour implies no more than an implicit reference to a previous experience. But true recognition, let us repeat, implies an apprehension of the relation between present and past experiences.

If we could recall our nonsense-syllables without seeing them again we should have a form of memory higher than recognition. Memory proper consists in the recollection of previous experiences as they occurred. We have a memory experience when we think again of an object previously thought of and realize that we are doing it; and accuracy of memory consists in thinking of it as it was thought of on the previous occasion.

A simple illustration may help to crystallize the distinctions among these various grades of mneme and memory. Suppose that I am reading a difficult treatise on philosophy, and am failing to understand what I read. I am interrupted, shut the book, and put it aside. When I resume my reading I do not know where I left off, so I start at a likely place; after reading a page I come to a passage that I recognize as having been read before. What effect had the previous reading of this page on me when I fail even to recognize it on a second reading? It must at least have made the second reading easier in virtue of the dispositions, feeble perhaps, that it left behind. Now, if I am determined to master the abstruse passage I shall read it again and again, and soon get to the

stage of recognizing it when I read it, the successive readings having strengthened the dispositions. Finally, the dispositions may become so strong and so well recognized that I shall be able to recall the passage at will.

Memory, then, is a complex process involving the establishment of dispositions, their retention, and the recalling of the experiences that have left the dispositions behind them. Bergson insists strongly on the difference between the mere possession of dispositions and the capacity for recall. He draws a sharp distinction between habit-memory and true memory, the former depending on mere motor mechanisms, the latter consisting in independent recollections. By the establishment and organization of dispositions we are enabled to make the right response to a situation; in other words, we have formed a habit. The learning of anything by rote is nothing more than a verbal habit: we 'roll it off our tongues' without in the least recalling the circumstances that attended the learning of it. True memory, on the other hand, involves images or mental pictures of past situations. Nunn¹ points out that Bergson's view involves an undesirable sundering of body and mind, habit-memory being an affair of bodily mechanisms, true memory involving mental activity. We can recognize the importance of Bergson's distinction without pressing it too far: perhaps it is a difference in degree rather than in kind. Even when we are remembering something by rote we may have recollections of the actual learning; and it seems probable that no habit-memory is imageless to begin with. Consciousness, in the form of memory-images, is eliminated when it ceases to serve a useful purpose. Adams' well-known dictum that "true learning is judicious forgetting" may be interpreted in this sense.

Many interesting results have emerged from the mass of experimental work that has been done on the subject of memory. The conditions of such experiments are simplified, as a rule, by the use of nonsense-syllables, which eliminate the very variable factors of meaning and interest. If it be objected that the conclusions arrived at from work on such

¹ *Education: its Data and First Principles*, pp. 45, 46.

material do not necessarily apply to intelligent memorizing it may be replied that sure results can be obtained only by varying the factors one at a time.

Series of nonsense-syllables may be used to determine the number of items that can be immediately reproduced after one repetition, and thus to get a measure of the memory-span; or they may be used to investigate the subject's power of retention. In the latter case various methods are employed. In the 'learning and saving' method a series of nonsense-syllables is shown one at a time at a regular rate. The subject says them as he sees them, and attempts a reproduction. They are shown him in similar fashion a second time, and again a reproduction is attempted. This goes on until the series is correctly reproduced. The number of repetitions required is an inverse measure of the subject's power to learn. After a suitable interval he tries to reproduce the series, and relearns it until he is again perfect. The number of repetitions saved in the second learning is a measure of his retention.

In the 'prompting' method the series is imperfectly learned, the efficacy of the learning being tested by the number of times the subject has to be prompted to get a complete reproduction. In the 'scoring' method the series is presented an agreed number of times, insufficient to ensure complete learning. Trochaic rhythm is employed, so that the syllables are learned in pairs. After an interval the first members of the pairs, in random order, are presented to the subject, who is required to reproduce their partners. The number of correct reproductions constitutes the score. The time taken to recall the items may also be measured; it is called the scoring time.

One important fact demonstrated by such experiments is that the power to reproduce immediately is different from the power to retain. Immediate reproduction or temporary retention would seem to depend on the number of repetitions and on the amount of volitional attention given to the task. Another factor called perseveration enters in. Perseveration is the name given to the tendency of dispositions to revive the experiences that produced them, spontaneously and without effort on the part of the subject. Examples of it are the ringing

of a tune or a form of words in the head, or the persistent recurrence of the day's events when one is trying to sleep. It is clear that subjects with a marked perseverative tendency will score well in tests of immediate memory.

The variation of immediate memory with age has been investigated, and the result obtained that the child has less power than the adult in this direction. Meumann found that there is a slow development of immediate memory up to the age of thirteen, a rapid advance from thirteen to sixteen, and a further advance till the age of twenty-five, when a maximum is reached. After that age there is a slight decline. It will be noted that the rapid increase of this power coincides with the period of adolescence. Immediate memory, since it varies from individual to individual, should be taken into account in tests for various occupations; for example, that of the telephone operator.

But the quick memorizer is not necessarily the sure retainer. Prolonged retention depends on the formation and organization of dispositions, and is concerned with the amount of the learning that may be regarded as a permanent possession. In the power to retain what is learned children show a decided superiority over adults. Retentiveness increases up to a certain age, probably that of eleven or twelve, then diminishes. Thus childhood, while unfavourable for memorizing, is favourable for retention. As Rusk points out,¹ the old adage, "Learn young, learn fair," is confirmed by experimental psychology if retentiveness is meant. There is some justification, then, for the idea that matter which has to be retained throughout life is best learned in childhood.

It has been discovered also that there are special memories. Our powers of remembering objects, sounds, words, abstract terms, ideas, numbers, and emotions are all different from one another and develop at different ages. The probable explanation is that memory in general depends on interest.

Experiments have been made to discover the best method of learning a poem, whether in parts or as a whole. From theoretical considerations we should expect the 'entire method' to

¹ *Experimental Education*, pp. 91, 92.

be superior, since it avoids the formation of needless bonds between the last and first words of a verse, and encourages needful ones between the last word of one verse and the first of the next. It has been proved, as a matter of fact, that the 'entire' method holds good with poems up to 240 lines in length. But this result requires certain qualifications. With children, according to Winch, the 'part' method is superior to the 'whole.' The discouragement experienced by a child when confronted with a lengthy task must be taken into account, and the glow of satisfaction felt when a verse has been mastered is an extra incentive with which we cannot afford to dispense. The obvious conclusion is that the child should learn as large units as possible without discouragement resulting.

'Mixed' methods combine the advantages of both. The material is divided into convenient sections, as large as possible; the first section is learned, then the second, after which the matter is recited from the beginning before the third is attacked.

A possible disadvantage of the 'entire' method, even for adults, is that it involves needless relearning of the easier parts when the material varies in difficulty. In such a case the difficulties can be mastered at the beginning, the 'entire' method being employed later. Another 'mixed' method is to begin at the beginning and proceed until the first difficulty is reached, stopping there until the difficulty is mastered; then to begin again at the beginning and proceed until the second difficulty is met and overcome, and so on until the end is reached.

Economy in learning derives also from a suitable distribution of learning-periods. It is more profitable to read through a poem once on each of ten consecutive days than to read it ten times on one day. Intervals allow for consolidation, which is always an important factor in learning. Since the dispositions need time to set, pauses are advisable.

Can the memory be improved by practice? The financial success of some systems of memory-training would seem to indicate that it can. Experiments have shown clearly that the power of committing to memory does improve with practice, and that the improvement may be transferred to material

other than that used to effect it. It is believed that such general improvement is due to the conscious adoption of better methods of memorizing. The subject sets himself more effectively to the task; he becomes habituated to the act of memorizing; he makes a more skilful use of rhythm; and he becomes interested in his own progress. But does practice improve a person's power of retaining what he learns? This question is usually answered in the negative. James, appealing to physiology, stated categorically: "No amount of culture would seem capable of modifying a man's general retentiveness. This is a physiological quality, given once for all with his organization, which he can never hope to change."¹ Such a statement loses its force if memory is believed to be a function of the mind as well as of the nervous system; and, as a matter of fact, Dr McDougall, collaborating with Miss M. Smith, has obtained some evidence that even retentiveness may be improved by practice. It is at least certain that the teacher ought to train his pupils in good methods of memorizing, and to call their attention to the value of such methods.

"To have a good memory is to have a well-organized mind." We remember readily the things that touch our interests, immediate or remote. Simple experiments readily show how very much easier it is to memorize material that has meaning than nonsense-syllables that are devoid of it; this is because we can and do have immediate interest in the former, and can readily organize the memory-traces with our existing mental systems. As in the case of attention, so in memory we come back to an affective-conative factor. Interest and volition are tremendously important in the economy of memory; the events we readily remember are those which have touched our emotions, our sentiments, or our self-sentiment.

Turning now to the obverse phenomenon of forgetting, we ask the question, "Why do we forget?" It might be better to ask, "Why do we fail to remember?" since an inability to remember is a failure in recall rather than in retention. There is every reason to believe that the after-effects of all experiences are permanent, and that, theoretically at least, it is not im-

¹ *The Principles of Psychology*, vol. i, pp. 663, 664.

possible to remember anything that has ever happened to us. Practically, however, it is only in favourable circumstances that the after-effects are sufficiently strong and well organized to determine a memory experience.

The main causes of failure to recall are lapse of time and lack of interest. That these factors act independently, however, is proved by the fact that intensely interesting events can be vividly remembered long after they have happened. The time factor operates when interest and meaning are at a minimum, as in the case of nonsense-syllables. It is well, too, to remember the Freudian principle of 'active forgetting.' Here it is not lack of interest that prevents recall, but too much of it. We tend to repress dispositions which, if allowed to determine a memory, would bring a conflict to the level of awareness.

The rate of forgetting due to lapse of time was first investigated by Ebbinghaus in 1885. Memorizing lists of nonsense-syllables and relearning them at various intervals, he was able, by the saving method, to calculate the amounts forgotten. He found that after twenty minutes 58 per cent. is remembered; after one hour, 44 per cent.; after nine hours, 36 per cent.; after one day, 34 per cent.; after two days, 28 per cent.; after six days, 25 per cent.; and after thirty days, 21 per cent. Thus forgetting is most rapid immediately after learning. After a lapse of thirty days one-fifth is still retained; and it is probable that there is permanent retention of an appreciable fraction which will, at any time, facilitate the relearning of the series. If similar conclusions apply to the learning of intelligible material we must conclude that revision of anything that has to be memorized is carried out most economically soon after the learning.

Other investigators have obtained similar results. The curve of retention falls rapidly at first, then gradually gets flat, never quite reaching the time axis. One,¹ however, found with nonsense-syllables that while after six hours 47 per cent. was retained, after one and two days the amounts were respectively 68 per cent. and 61 per cent. Why should the further lapse of

¹ Radossawljewitsch.

time improve the memory? The most obvious reason would seem to be the freedom from fatigue that results from a night's rest; and psychologists who approach the matter from a behaviourist standpoint must content themselves with such an explanation. Others, however, fail to find in the principle of fatigue an adequate cause of this phenomenon, and invoke the principle of consolidation already described in Chapter III. Along with the obliviscence that takes place as a result of lapse of time, there is reminiscence, due to the endopsychic consolidation and organization of the memory traces into engram-complexes.

In a well-known monograph Dr P. B. Ballard¹ describes his extensive investigation into this matter. He says:

My attention was first drawn to Reminiscence in this way. The children in a certain slum school were alleged to have very bad memories: it was said that they could learn but little, and what little they learnt they could not retain. I tested this statement by setting the top class of boys, whose average age was twelve years and ten months, to memorize Cowper's *Loss of the Royal George*. They were allowed thirteen minutes, and at the end of that time the books were collected and the boys were asked to write out as many lines as they could remember. After setting aside and leaving out of account the boys who were in any way familiar with the poem, nineteen remained as subjects of the experiment. Only one boy was able to write out the whole of the thirty-six lines, and the average number of lines for the class was 27·6. After two days' interval I again tested the boys. They were asked to write out all they remembered then. Neither teacher nor scholars expected this second test, and no opportunity was given for revision. Much to the teacher's surprise, eight of the boys wrote out the whole poem correctly, and the average number of lines correct was 30·6—an increase of more than ten per cent. over the previous number. Out of the nineteen boys none had deteriorated and sixteen had improved. This result seemed to be so remarkable that I set a similar test in several other types of schools, and always with the same result. After two days' interval more was remembered than immediately after the learning.

¹ *Obliviscence and Reminiscence* (*Brit. Jour. Psych.*, Monograph Supplement, No. 2).

Many such experiments were carried out, of which it will be sufficient for our purpose to quote the results of one. Thirty-four lines from Part II of *The Ancient Mariner* were selected and used as material for a test involving 5192 children in forty-two senior departments of elementary schools. The children were provided with copies of the extract, which was read to them; they were then given fifteen minutes to learn it, and required, at the end of the period, to write out what they could remember. A second test was given unexpectedly after an interval of one day in some schools, two in others, three in others, and so on up to a maximum of seven days. Marking was by lines transcribed correctly, no account being taken of sequence. Taking the total results, the average number of lines correctly reproduced immediately after memorizing was nearly fourteen. The gain or loss after the various intervals is seen in the table below.

Interval (days)	Gain (per cent.)	Loss (per cent.)
1		1.6
2	9.4	
3	6.1	
4		2.0
5		5.8
6		8.7
7		12.1

As obliviscence is a gradual process of deterioration in the capacity to revive past experiences, so is reminiscence a gradual process of improvement in that capacity.¹

In an important section of the monograph Dr Ballard proves that reminiscence and obliviscence are going on at the same time, counteracting each other's effects. The improvement after two days really represents a credit balance in favour of reminiscence. From the above table it is clear that on the second and third days reminiscence outweighed obliviscence,

¹ Ballard, *op. cit.*

and on all the other days the opposite was true. Dr Ballard was able to separate reminiscence from obliviscence by a detailed analysis of the scripts. He found that the primary and secondary scripts differed not only in quantity, but in actual content; lines appearing in the first did not appear in the second, while lines absent in the first were present in the second. Thus, when an improvement after an interval was manifested reminiscence was greater even than it appeared at first sight, since a certain amount of it was needed to balance the obliviscence that had taken place. In one test, for example, in the primary scripts 449 lines were written by forty-six boys; in the secondary 465 lines. There was therefore an improvement of 16 lines for the class as a whole. But analysis revealed that of the 465 lines in the secondary test 107 were new; 91 of the original lines had been forgotten. Reminiscence here is represented not by 16, but by 107, while 91 indicates the obliviscence.

For the details of these fascinating investigations the student is referred to the original paper. The author's main conclusions are that the improvement takes place without thought being given to the matter in the interval, although subjects who think of it casually between the tests show slightly more improvement than those who do not; that the amount of improvement shown depends on interest; that the degree of improvement varies with the age of the subject, being greatest with young children and negligible with adults; that obliviscence and reminiscence occur together; that the interval for maximal reminiscence is about two days.

For an explanation Dr Ballard rejects the fatigue theory as inadequate, and offers alternatives in terms of psychical dispositions or growth of brain structure. It is well in accord with the doctrine set forth in these pages to believe

that the excitement of a disposition does not die out immediately after the corresponding experience passes out of consciousness, but continues in a lower or modified form for some days after, and thus tends to arrest and reverse the process of dissolution.¹

¹ *Obliviscence and Reminiscence*, p. 53.

SUGGESTIONS FOR FURTHER READING

McDOUGALL : *An Outline of Psychology*, chapter x.

NUNN : *Education : its Data and First Principles*, chapter iv.

SPEARMAN : *The Abilities of Man*, chapter xvi.

• RUSK : *Experimental Education*, chapter vii.

COLLINS and DREVER : *Experimental Psychology*, chapter xiii.

JAMES : *The Principles of Psychology*, chapter xvi.

BALLARD : *Obliviscence and Reminiscence*.

CHAPTER XII

THINKING AND REASONING

HAVING considered, in earlier chapters, the affective and conative aspects of our mental life, we must now turn our attention to cognition, or the knowing aspect. Every experience involves a knowing of some psychical object. In instinct-experience this psychical object is occasioned by something in the outer world to which the animal, by its very nature, cannot be indifferent. We must suppose, then, that the instinctive disposition itself is organized in such a way as to be awakened in the presence of such objects; that it possesses, as McDougall says, a lock that can be turned only by keys of a certain pattern. This lock is the cognitive aspect of the instinct; it is an instance of the cognitive dispositions with which the mind is stored, and which may be defined as "enduring conditions which render possible the thinking of certain objects."¹ Just as the affective-conative dispositions are capable of endless enlargement and modification, so are the cognitive dispositions, the result being the growth of knowledge-systems in the mind. To know anything is to possess an active cognitive disposition corresponding to it; perfect knowledge would consist in the possession of cognitive dispositions, properly organized, having a one-to-one correspondence with all the things to be known. Such a mind would be a faithful mirror of the universe in all its aspects.

Many writers restrict the term 'thinking' to the higher mental activities of which man alone is capable, but such a limitation seems unnecessary as well as undesirable. There is at the higher levels no new mystery which is not involved in the less exalted forms of mental activity. It seems advisable, then, to formulate a very general definition of thinking, such as "mental activity in its cognitive aspect," or "mental activity

¹ McDougall, *An Outline of Psychology*, p. 259.

with regard to psychical objects," whether or not these objects are occasioned directly by objects in the outer world. We can then distinguish, not different kinds of thinking, but rather the various levels which are determined by the nature of the psychical object.

The first level is perceptual thinking, usually defined as "mental activity with regard to objects present to and affecting the senses." We must remember, however, that, strictly speaking, the object of thought here is not the object in the outer world, but the psychical object occasioned by it. The connexion between the two is involved and obscure. I cannot put a material object inside my mind and examine it; and when, for example, I look at a pen it is certainly not the pen itself that is the object of my thinking. Ether waves emanate from it to my eye, giving rise to physical and chemical processes in that organ, which again result in nervous currents being conveyed to certain areas in my brain, making these active in turn. The mysterious gap between the physical and psychical worlds is then bridged, and an object of thought, or psychical object, is before my mind. Such a psychical object, resulting from the stimulation of a sense-organ, is called a 'sensation'; it is interpreted as a sign of something in the outer world, but it is not itself that thing. Further, a 'sensation' is a pure hypostatization, for it is only the objective aspect of perceptual thinking. Psychologists, in their attempts to analyse the stuff of consciousness, used to point to the sensation as the ultimate mental element, describing the mind as a mosaic of sensations; but in so doing they ignored the essential activity of the thought process. We must, then, emphasize the point that perceptual thinking, or perception, is mental activity with regard to sensations, which have no existence apart from such activity.

The sense-organs, by whose agency we have sensations, have developed in the course of evolution. They are highly selective in their action, determining which of the many streams of energy playing upon us from outside will result in psychical objects. It is well to remember that the senses, in themselves, are totally inadequate to the task of supplying us with complete

knowledge of the physical happenings which surround us. For example, as I sit writing, ether waves from the broadcasting station are reaching me, but I do not become aware of them until I allow my wireless set to transform them into sound waves which will affect my ears. Clearly there may be many other stimuli to detect which I have no such apparatus; and it is possible that the proverbial sixth sense might supply me with much additional information about my surroundings.

For details of the physiology of the five well-recognized sense-organs the student is referred to the appropriate textbooks. We have special receptors for seeing, hearing, smelling, and tasting; and, while any part of the body may be used for touching, the tips of the fingers are more specialized in this direction than any other part. Touch has been well called the "mother sense," for all the others may be looked on as specializations of it which have arisen in the course of evolution. The eye and the ear receive stimuli from a distance, and are therefore called "distance receptors"; our senses of sight and hearing are of outstanding importance in bringing us knowledge of the outer world. Smell has undoubtedly played a large part in the development of the race, but in human beings it has lost much of its importance. Since odours are found in greatest intensity and variety near the ground, it is probable that when man assumed an upright posture and got his nose in the air he began to rely less on his sense of smell to find food and escape danger.

It should not be supposed that the five sense-organs are the only means we possess of receiving stimuli which result in characteristic sensations. A sense of temperature or one of pain is neither seeing, hearing, smelling, tasting, nor touching, yet it has a characteristic quality; and for such senses we have definite receptors in the skin. Likewise we have organic sensations such as hunger, thirst, feeling well, or feeling ill, which are important constituents of our experience. We cannot localize such sensations, for their receptors are in the digestive and other interior organs of the body. Lastly, we have the kinæsthetic sense, by which we are kept aware of the position of the trunk, head, and limbs. It has various receptors

in the joints, muscles, and tendons, and a highly specialized one in the labyrinth, or inner ear. The giddiness of a waltzer is due to over-stimulation of the labyrinth, and the collapse of a boxer who receives a knock-out blow on the jaw is a result of the shock received by the same organ. It is worth noting that the waltzing rat is endowed with a highly complicated labyrinth.

All thinking other than perceptual may be described as imaginative, there being no difference in kind, but only one in level. Imaginative thinking, then, is mental activity with regard to psychical objects which are not sensations—that is to say, which are not occasioned by the stimulation of a sense-organ. In imaginative thinking, again, we may distinguish different levels according to the nature of the psychical object, the simplest form of which is the primary memory image. “An image,” as Drever puts it, “may be defined as our apprehension of an object or objects in the absence of the object or objects themselves which originally determined our sense-perception.”¹ Primary memory images may be regarded as substitutes for actual sense-perceptions. When I actually look at a book, for example, the psychical object is a sensation; but if I close my eyes I can see it again, and the psychical object is now a visual image. Clearly we may have images corresponding to every variety of sensation. Hearing a tune in imagination is an example of an auditory image; enjoying in imagination the scent of a rose, an olfactory image; eating a lemon in imagination, a gustatory image; and drawing a finger over sandpaper in imagination, a tactual image. In addition we may have temperature and pain images; for example, we can hardly avoid shivering in imagination when we read:

St Agnes’ Eve—ah, bitter chill it was!
The owl, for all his feathers, was a-cold.

We can imagine feelings of hunger or illness, so having ‘organic’ images; and we can have kinæsthetic images, imagining, for example, what it is like to bend down and pick something up from the floor. It is possible to have any or all of these types

¹ *Introduction to the Psychology of Education*, p. 190.

of imagery; but, just as in sense-perception seeing and hearing are much more important than the other sensory powers, so in imagery visual and auditory images are normally the most important for our thinking. Most people have more vivid images in either or both of these classes than in any other; but some are 'visiles,' preferring visual imagery, while others are 'audiles,' preferring auditory. Simple experiments reveal the types where they exist.

In imagery we tend to initiate the motor adjustments of the bodily organs that would accompany the corresponding sensations; thus in a vivid visual image we begin to focus the eye muscles, in a gustatory image the mouth 'waters,' and in a kinæsthetic image the body becomes taut. Such facts are seized upon by the behaviourists, who argue that our mental life is nothing more than the responses of the body to stimuli. But imagery is a quality of experience *sui generis*; introspection tells us that one of the essential characteristics of an image is that it is experienced as not present to the senses; in other words, that it is experienced not as a percept, but as an image. Compared with the corresponding percept, it is less vivid, less steady, and less detailed; but it is something more than a percept that is lacking in these qualities.

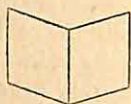
So far in our account the psychical object has had the attribute of particularity. How do we come to have the power of entertaining general ideas? To some extent the mind can form generalized images by cutting away from individual images all that is particular, and combining what is common to all. Thus one may have a shadowy, nondescript image of 'dog' that is not a memory-image of a particular dog. Such an image, however, cannot be absolutely general; the dog in the mental picture must possess the essential attributes of dogs in some degree of particularity, having ears, tail, and legs of particular lengths, and a certain colour, though that may be nondescript. The race and the individual have evolved better ways of thinking about things in general than by employing generalized images which, even if they were general, would be cumbersome and uneconomical. To understand these ways we must attack the questions of conceptual process and language.

Some have denied altogether that there can be a psychical object before the mind that is not a sensation or an image, concrete, generalized, or verbal. But when I think of, say, a dog, either perceptively or imaginatively, I can discern two aspects in the object of thought. There is, first of all, particularity: the dog is a particular dog in all sorts of details. But, in the second place, the object possesses a universal character which is exemplified in this particular instance; the very fact that I have a name to give to it proves that. Thus the psychical object has particularity and universality at the same time. The nature of the connexion between the particular and the universal has often been debated, and it constituted one of the main problems which occupied the attention of the schoolmen toward the end of the Middle Ages. Their views crystallized into three main doctrines—realism, nominalism, and conceptualism. The realists asserted the real and independent existence of the universal as apart from its particular embodiments; long before the days of the schoolmen Plato taught, in picturesque language, that universals exist apart from particulars in a region beyond the heavens, and are more real. The nominalists denied this emphatically, asserting that what we call a universal is merely a name which we apply to large numbers of objects that resemble one another sufficiently to justify it; only the individual is real, universals having no objective existence at all. The conceptualists, of whom the chief was William of Ockham, who flourished at Oxford in the fourteenth century, agreed with the nominalists up to a point, but taught further that universals have real existence in our own minds.

The debate between realism and nominalism is a matter for the philosopher rather than the psychologist, whose concern is with the position of conceptualism. Whether or not universals have real, objective existence, there can be no doubt that our minds have the power of dealing with the universals, or patterns of things, as well as with the things themselves. In so doing they are working on the highest level of the thinking process.

Up to this point we have been regarding the universal as an aspect of the psychical object; but the power to think of such

an aspect implies the existence in our minds of organized cognitive dispositions which possess a high degree of generality. It is to such dispositions that we may most usefully apply the term 'concepts.' From this standpoint, then, concepts are patterns, schemas, or mental categories which enable us to interpret the objects of our thought, whether perceptual or imaginative; they are to be thought of as active cognitive dispositions which direct and govern our apprehension.¹ When we look at anything, for example, what we see depends on the pattern we apply. The accompanying diagram might be interpreted as a picture of a folded sheet of paper with the crease turned either outward or inward; or, for the mathematician, it might mean two equal parallelograms having a side in common. All depends on the concept or pattern in the mind that is applied to the interpretation of the sense-data which, presumably, are the same for all. Again, when contemplating a pattern on a wall or a floor the untutored mind may see nothing but a pattern, more or less artistic, while the mathematician may read into it certain universal truths of mathematics. Wordsworth paints for us the unimaginative Peter Bell:



A primrose by a river's brim
A yellow primrose was to him,
And it was nothing more.

But, for the poet himself,

the meanest flower that blows can give
Thoughts that do often lie too deep for tears.

The one mind was stored with matter-of-fact concepts relating to ordinary things, but the other possessed philosophical concepts which were ready to interpret even the wild flower by the wayside.

How do we come to have such patterns? The usual account that is given is in terms of analysis and synthesis of objects of experience. The mind analyses the objects and synthesizes what is common to all, neglecting what is merely particular.

¹ Nunn, *Education: its Data and First Principles*, p. 105.

Thus the concept of the cat family, for example, is said to be formed by abstracting all that is common to domestic cats, lions, tigers, panthers, pumas, and so on, the highest common factor constituting the concept. We may see an example of such mental analysis and synthesis in the teaching of a general rule in arithmetic. We give several numerical instances, say, of finding the simple interest on a sum of money in a given time; the result, when achieved, is that the pupil abstracts the procedure common to all, and learns to concentrate on the process rather than on the actual numerical details of an example.

The analytico-synthetic procedure outlined above is extremely important in the formation of concepts, but the account, as it stands, is altogether too crude. Pushed to its logical conclusion, it would imply that a concept is an exclusive entity in the mind, a barren pattern devoid of all the detail that gives it significance. It is really doubtful whether such a process would result in anything at all that could reasonably be called a concept, since even the common elements would differ in the details of their particular exemplifications. A concept, on the contrary, is inclusive rather than exclusive; it is a rich entity which binds together the particulars, uniting them into a comprehensive whole. No doubt our concept of the cat family has 'common elements,' as prominent features, but it includes rather than excludes the possibility of, say, the tiger's stripes.

In a well-known research Dr Aveling provided his subjects with various series of pictures, each member of a series having a feature in common with all the other members, and being labelled with the same nonsense-word. Thus, for example, a set of pictures whose common feature was the representation of a boy in rapid motion had the label 'Ferod.' By inspecting the pictures the subject eventually acquired a meaning for the word. Professor Spearman, in describing his experience as a subject, denies that the concept was evolved merely as a disintegration of the experiences and a retention of the common feature. "The residuum," he says, "instead of being only the feature common to every picture, was in some sort a temporary

confusion of the entire different pictures, including (though more faintly) their differing characters." ¹ His evidence thus confirms the inclusive view of the concept advocated here.

The growth of concepts in the mind can be observed to some extent when little children begin to speak. A child of about fifteen months saw a spring balance with dial and hand, and immediately labelled it "tick-tock," thus showing that he had, to a certain extent, analysed his experiences of actual clocks and abstracted the prominent elements of face and hands. Somewhat later he had his first experience of a grandfather clock, and was tremendously interested in the swinging of the pendulum. About the same time he saw an electric-light cable swinging on the wall, and again applied his word "tick-tock." It seems likely that his concept of a clock was becoming inclusive rather than exclusive, and that it contained, at one and the same time, the possibilities of a clock having and not having a pendulum.

Do we inherit from our ancestors any concepts that are independent of our own individual experience? Is there any truth in the old theory of innate ideas? Jung believes that we come into the world with certain innate cognitive dispositions or archetypes, by means of which we interpret our experience from the start. According to this view our intellects are not products of individual experience alone, but are endowed with certain patterns of a very general nature which "coerce intuition and apprehension to forms specifically human." Examples of such archetypes are our concepts of space and time; we are bound, by the very constitution of our minds, to interpret our experience in terms of such categories. This is perhaps why it is so difficult to get any clear notion of modern theories of space-time.

We have certain preconceived ideas about location in space which have come down to us from ape-like ancestors. They are deeply rooted in our mode of thought, so that it is very difficult to criticize them impartially and to realize the very insecure foundation on which they rest.²

Our power of forming concepts would be very rudimentary

¹ *The Nature of 'Intelligence' and the Principles of Cognition*, p. 268.

² A. S. Eddington, *The Nature of the Physical World*, p. 16.

without language, which is, indeed, the chief instrument of our thinking. The most obvious function of language is, of course, to communicate thought to others, and the term may be used to include any means of doing this. In such a wide sense a map of a country, a picture, or a piece of music would be examples of language. But the word is usually reserved for the special systems of signs which have been devised for the express purpose of communicating thought.

Taking the narrower meaning, we may distinguish two kinds of language: firstly, the language of natural signs, and, secondly, the language of artificial signs. Natural signs have some obvious relation to the thing signified, as in gesture-language and the picture-writing of early peoples. Conventional signs have no such relation. The deaf-and-dumb alphabet and the Morse code, for example, consist of signs that have meaning purely by convention; and in ordinary speech there seems no reason why the words 'cat' and 'dog' should not be interchanged. We shall see some evidence, however, that verbal language is not as conventional as it appears, and that it may have evolved from a more primitive gesture-language.¹

The origin of some words is obvious: they are onomatopoeic; that is to say, they are imitations in speech of sounds associated with the object or action that is named. Examples of such words are 'cuckoo,' 'clang,' 'splash,' and 'pom-pom.' Others may be called sound-metaphors, since they express suitably in sound, ideas that are not themselves sounds. 'Quiver' and 'quagmire,' for example, give a strong suggestion of shaking; 'flounder' and 'flop' seem to bear out their meaning of clumsy movement; while 'mamma' in contrast to 'papa' indicates the gentler sex by its softer sound.

Other words are sublimations or refinements of bodily gestures; in using them we are performing, with our vocal organs alone, gestures that used to be made with the whole body. When we say 'yes,' for instance, we draw in our lips, while when we say 'no' we shoot them out. These common words are relics of gestures of acceptance and refusal performed with the whole body at earlier stages in the

¹ See Nunn, *Education: its Data and First Principles*, pp. 211 et seq.

development of the race and the individual; we can understand their genesis when we see a baby accepting or refusing his food by drawing his bottle toward him or pushing it away in an extremely vigorous if unrefined fashion.

Similarly we may explain the peculiar fitness of such words as 'strong,' 'strangle,' 'strenuous': the stretching of the lips required to make such sounds is undoubtedly the residuum of a larger bodily gesture. Many people seem to find it necessary to reinforce their spoken language with suitable gestures; and, indeed, it is said of some primitive tribes that they cannot understand one another in the dark.

Whether or not words are natural substitutes for things and actions, it is at least certain that they are very real and intimate substitutes in a psychological sense. Savages, we are told, have difficulty in distinguishing between a thing and its name, the two becoming fused together in their minds. Our own names are a part of our very selves, and we will not readily give them away to strangers in railway carriages, for example. Similarly, a little child frequently needs great persuasion to tell his name even to a friendly stranger. We seem to feel that, if people possess our names, they possess us to some extent and have power over us; and we certainly do not care to have our Christian names used except by those whom we accept as friends. It is probably this truth that is at the root of the practice of 'naming' a member of the House of Commons who is to be suspended; and we see it further exemplified in legends such as *Lohengrin*, where the hero conceals his name. Again, the reason that many words are taboo in polite speech is that they denote things that are either too august or too disgusting; here we see once more the close psychological connexion between a thing and its name.

Every teacher knows that he can acquire no real ascendancy over a class until he knows the names of individual pupils; and the beginner in teaching should always make this his first task. It is extremely effective to require a troublesome boy to give his name, or, following the hint given by Ward and Roscoe,¹ to demand and write down the name of such a boy.

¹ *The Approach to Teaching.*

The boy does not in the least know what use is to be made of the information, but he imagines many things, and knows that, in some mysterious way, his teacher has acquired power over him.

The importance of language in conceptual thinking can hardly be over-estimated. Without it we might be able to form rudimentary concepts from the analysis and synthesis of perceptual experience; but we should have no means of stabilizing them in our minds, or of communicating them to others, if we had no words with which to label them. As Professor Spearman puts it, language makes our concepts "become like molten bullion poured into coining-moulds, whence . . . they issue as legal tender for general circulation." ¹

When we obtain concepts from the analysis of perceptual experience, and label them by means of words, we use language to extend their significance still further. My concept of 'sugar,' for example, would be very rudimentary if I could not read or talk about the various aspects of it that have never entered my perceptual experience. Again, it would be impossible without language to possess abstract concepts, such as liberty, justice, and goodness. For some concepts, indeed, a specialized language is required. The binomial theorem could neither be held in the mind nor expressed without the symbolism of algebra; and it would be nearly as difficult to understand or describe the chemical composition of even a comparatively simple aromatic compound, such as picric acid, without utilizing the convenient language of the benzene ring. The symbols of algebra and chemistry bring out very clearly what is true of all language—namely, that not only does it fix the results of our thinking, but it furnishes the only means by which that thinking may be extended.

Thus language is the tool of thought: as Professor Stout says, it is "essentially an instrument of conceptual analysis and synthesis." ² We do most of our thinking by means of verbal images—visual, auditory, or motor. This convenient tool, however, may easily become a snare, for words very soon come to tyrannize over thinking. We give names to things and

¹ *The Nature of 'Intelligence,'* p. 264.

² *Groundwork of Psychology,* p. 149.

then suppose that we understand them, the words serving as "mental havens"¹ in which we take refuge. We must realize, too, that our words do not cover the whole of the cognitive field, which is continuous while our vocabulary is not. We usually say that there are seven colours in the spectrum, and we have the compound words 'greenish-yellow' and 'yellowish-green' to describe the stages intervening between two well-recognized hues which have names; but clearly there are many shades for which we have no words at all. It is surely incorrect, then, to assert that concepts cannot exist without language. We frequently have concepts for which we can find no suitable words, thoughts that elude expression. "The cognitive field may, then, be compared to an ocean studded with icebergs. . . . Only dotted here and there has the thought frozen into verbo-conceptual rigidity."²

So far in our account of thinking we have been dealing mainly with the objects of thought, such as sensations, images, and universals, and with the cognitive dispositions whose existence we must assume in order to account for the possibility of such thinking. In what does the actual process of thinking consist? To find an answer to this question we shall do well to consider two far-reaching principles, the *eduction* of relations and the *eduction* of correlates, formulated by Professor Spearman and stated by him to be basal to the thought-process at all its levels.³

The principle of *eduction* of relations runs as follows: "The mentally presenting of any two or more characters (simple or complex) tends to evoke immediately a knowing of relation between them." This is a fundamental law of mental activity in its cognitive aspect, and our minds are constituted so that they must obey it. A simple example should make its meaning clear: if 'blackness' and 'whiteness' are objects of thought to us, our minds immediately tend to evoke the relation of 'opposite' between them. Sense-perception provides us with the simplest type of presented characters or 'fundaments,' but the relations *educed* by the working of the law

¹ Spearman, *The Nature of 'Intelligence' and the Principles of Cognition*, p. 265.

² *Ibid.*, p. 276.

³ *Op. cit.*

may themselves become new fundamentals which are, in turn, related to one another. Indeed, there is no end to the application of the law.

The principle of eduction of correlates is that "the presenting of any character together with any relation tends to evoke immediately a knowing of the correlative character." This second law of mental activity is complementary to the first, and is equally fundamental; again, we may say that our minds are made so that they must obey it. We may illustrate it by rearranging the above example: if the fundament 'blackness' and the relation 'opposite' are presented to us the correlate 'whiteness' is immediately educed.

We see the joint working of the laws in the 'analogies' test. "Moon is to earth as earth is to —?" What does the mind do in producing 'sun' to fill the blank? It finds the relation 'satellite' between 'moon' and 'earth' by means of the first principle; then it goes with this relation to the character 'earth' and produces the correlative character 'sun' in virtue of the second.

These laws, then, indicate the lines on which the mind is active, and they apply to all the levels of thinking. When we considered perceptual thinking we saw that a 'sensation' is a hypostatization, since it is merely the name given to the psychical object which inevitably provokes the thought. When a sensation is before the mind, the mind, by its very nature, sets about its business of finding relations and correlates and, by so doing, contributes meaning to the sensation. The meaning given depends on the fundamentals and relations with which the mind is already stored; thus different people will give various meanings to the same sensory stimulus. Referring to the diagram on p. 202, we see that the mind that interprets it as a folded sheet of paper with the crease turned inward is either evoking a relation of likeness between the sensation and such a concept, or, taking the presented sensation and the relation of likeness, is finding a concept that will serve as a correlate. We cannot realize too clearly that meaning comes from the mind itself, and that it is not inherent in the object that is perceived. We can read bad writing so long as we

know what it is about; that is to say, so long as the mind can educe the proper relations and correlates; but if we come to an unfamiliar proper name we are in difficulties, because the mind is failing to make its contribution.

Perception, as used to be said, is "sensation with a fringe of meaning," and meaning is the result of the mind's activity. When the meaning is richer and fuller the mental activity is called *apperception*, the term implying that something has been added to mere perception, and that cognitive dispositions have been permanently enlarged and enriched. Apperception takes place not only in perceptual thinking, but in imaginative thinking also. Whenever attention to an object of thought is sustained, that 'idea,' as the Herbartians say, is received by an 'apperception mass,' and finds a permanent place in the mind.

In imaginative thinking the unceasing eduction of relations and correlates results in the building up of new mental content. Memory is a reproductive form of imagination, consisting as it does in experiences that bear apprehended relations of similarity to past experiences; but what is popularly called imagination is something much more than this, involving the constructing of the elements derived from past experience into new wholes. This constructive imagination may assume two main forms: we may educe relations and correlates on the lines laid down by others, or we may ourselves be responsible for the lines on which the new mental content is formed. In reading a novel or in following a mathematical argument, for example, our constructive imagination is imitative; but in writing a novel or in working out a new theorem it is creative. Creative imagination, in turn, permits of subdivisions that are of some importance for education. Such imaginative thinking is said to be pragmatic when it is rigidly controlled by conditions accepted from outside, and when it is directed toward an end, either of action or understanding. The engineer who plans a new viaduct accepts such control from the laws of physics, and the framer of new scientific hypotheses must take proven facts as material for his creations of thought. Imagination may properly be called *aesthetic* when no such outside

control is accepted; when the thinker is free to make what he will out of his material, as in the writing of novels or poetry, the composition of music, and the painting of pictures. It is, of course, true that great artists do accept conditions of consistence and congruity, but these are imposed by themselves. When, as in the case of a Shakespearean tragedy or a Beethoven symphony, such conditions of 'unity in diversity' are accepted we have truly artistic creations; when they are not, and the imagination is allowed to run riot, we have something that is fantastic rather than artistic.¹

Considerations of space forbid a more detailed discussion of these matters; but one form of the pragmatic imagination, namely, reasoning, calls for further examination on account of its extreme importance in intellectual education. Reasoning is the imaginative solution of a problem; with a definite end in view, we educe relations and correlates to help us to find a schema that is congruent with reality. "To reason is to perform an ideal experiment"—that is to say, an imaginative experiment. Animals and young children who cannot reason must solve their problems by means of trial and error on the perceptual level; but man can avoid the wastefulness of such a process by carrying it out on the imaginative plane. There is, however, no essential difference in kind between the mental processes involved in actual experiment and those involved in reasoning, but only one in level.

One or two examples may serve to bring out the important point that when we reason we experiment, not with actual things, but with substitutes for these things in the shape of visual images, words, or symbols. The following is one of Dr Burt's reasoning tests for the age of eight: "I don't like sea voyages; and I don't like the seaside. I must spend Easter either in France or among the Scottish hills or on the South Coast. Which shall it be?" In deciding that the Scottish hills will suit me best I make a rapid imaginative journey to France and find that I have an unpleasant crossing, then go to the South Coast and find that I am at the seaside, which I do not like. The thoroughly unintelligent being would

¹ See Drever, *Introduction to the Psychology of Education*, pp. 192 et seq.

actually have to perform the trials and suffer for the errors, but the reasoning being avoids both by finding a suitable holiday resort in imagination.

"In a school of sixty boys, thirty-two learn neither German nor Greek. If twenty learn Greek and eighteen learn German, how many learn both?" The adult quickly replies that there must be ten who learn both, but as a rule finds it difficult to explain in words exactly how he reaches his conclusion. But the teacher in explaining the problem and its solution to his pupils might proceed as follows: "Suppose that the Greek class is going on, and the rest of the boys are in the playground; then there will be forty boys in the playground. Now the German master wishes to collect his class, so he goes to the playground and finds only eight, since thirty-two of the forty are learning neither German nor Greek. His remaining ten pupils must be in the Greek class. Thus there are ten who are learning both Greek and German." Again a solution is reached by an imaginative experiment. The quicker solution of the adult is reached by cutting out the visual imagery and using the words and figures as tools of thought.

One might multiply such examples, but the student ought to find it amusing and profitable to work out some for himself on the lines indicated. Chess and bridge problems involve imaginary playing of the game; and geometrical proofs frequently show their practical origin when they are couched in terms of imaginative doing. Whether or not actual concrete imagery is employed, reasoning always involves the finding of relations and correlates that are congruent with reality. It is said that Kepler, who discovered the laws of planetary motion, tried many curves before he found that a planet moves round the sun in an ellipse; in his trials he was clearly seeking a relation that would bind together the facts of his observation. Newton, in turn, found in the universal law of gravitation the relation subsisting among Kepler's three laws, so constructing a wider schema that would include them. The whole progress of science has consisted in the relation of fact to fact, fact to generalization, and generalization to generalization, and in the discovery of new facts by means of the principle of corre-

late-education. The goal of science is the discovery of all facts and their inter-relationships.

We conclude this chapter with the examination of a few pedagogical problems which the foregoing considerations may help us to solve. The first of these is the training of the senses. Since the senses are gateways to the external world, adjustment to which must always constitute a major problem of education, it is not surprising that many of the great educators have stressed the importance of sense-training. Rousseau, for example, believed in the importance of practical problems in early education, and advocated training the senses by such means; while in modern times Montessori regards sense-training as an essential feature of her method. Much of the famous 'didactic apparatus' is designed to train sensory acuity: for training perception of size sets of wooden cylinders varying in either or both of their dimensions are used; for form geometrical shapes fitting into frames; for hearing boxes identical in shape and size, but containing different things; for colour different shades of wool. What is it that Montessori achieves by means of these exercises? There is no doubt that the child becomes highly proficient in his performance of them; but, in order to account for his improvement, there is no need to assume that the sense-organs themselves, or the sensory areas in the brain, are developed. The eye does not, by being used, become a better eye in a physiological sense; indeed, it tends to become less efficient. What is trained is doubtless the child's power of perceiving, of discriminating and interpreting his sensations, the educational importance of which cannot be denied.

How far is the Montessori method of sensory gymnastics justified? The exercises are evidently performed for their training value, for no one would assert that the power to match wools or to tell the contents of tins by shaking them is of much direct use in life. But it is extremely doubtful how much of the training obtained in so limited a field is transferred to the seeing and hearing of other things. Yet Montessori is certainly right in emphasizing the importance of the senses in early education, for, to a large extent, the higher

intellectual life has its foundations in sense-perception. Deficiency in any type of sensory experience is bound to result in a corresponding incompleteness of the inner mental life; and it is clearly the first task of a school medical service to remedy, as far as possible, defects in the sense-organs. An exception such as the famous Helen Keller—blind, deaf, and mute from the age of two, yet a university graduate, a linguist, and an author—only proves the rule; and it is permissible to speculate what this amazing woman would have achieved had the usual channels of communication with the outer world been open to her.

If one doubts the value of the Montessorian gymnastics what is to be done? Instead of trying to train the senses by means of 'didactic apparatus,' we ought systematically to give the child as wide sensory experience as possible. Investigations have revealed the appalling ignorance of city children with regard to such ordinary things as butter, sheep, and potatoes; teachers, therefore, should take nothing for granted with children coming to school, but should explore the contents of their minds before starting the work of instruction. Many a lesson goes wrong merely because the teacher is assuming the existence of sensory experience that is not there. Parents can do much by taking their children into the country, so widening their sensory experience; and their efforts in this direction are more to be commended than their attempts to teach reading and writing at home by obsolete methods. But the school itself must take the matter in hand, and seek to give the requisite sensory experience by means of practical work, educational visits, and school journeys. Verbal lessons to young children are bound to be ineffective if there is no background of actual experience; it is difficult, for example, to see how a lesson on tides can be of any real value to a child who has never been to the seaside.

Another problem in pedagogy made acute by the writings of Montessori is the training of the imagination. In order to consider this matter, we may profitably recall the various aspects of imaginative thinking that we have already distinguished, namely, the pragmatic, the artistic, and the fantastic.

Our decision with regard to the value of training one of these aspects need not necessarily apply to the others.

Montessori, as is well known, would deprive the child of his fairy-tales and discourage him in his weaving of fantasies. His delight in these figments of the imagination is a measure of his immaturity; and the directress, since her object is to transform immature beings into reflective adults, must encourage her charges from the first to "put away childish things." Myths and fairy-tales encourage the child's tendency to live in fantasy, leading him to expect supernatural intervention in the shape of fairy-godmothers whenever he is in difficulties, and hindering him from adjusting himself to the real world of fact. They are therefore to be condemned.

Her attitude reminds us forcibly of the psycho-analytic doctrine that fantasies are to be regarded as compensations for repressed tendencies, and that they tend to be regressive in nature. Whether or not fantasies are morbid, however, depends entirely on the degree to which the individual habitually escapes into the world of imagination; a limited amount of day-dreaming probably has a beneficial effect, since it provides a cathartic outlet for tendencies which, for one reason or another, cannot be allowed direct expression. If the individual stands up to his task of confronting the difficulties of life in a resolute manner his occasional lapses into fantasy need not worry us. The psychology of the unconscious merely warns us to look out for fantasies that are regressive.

Montessori is altogether too sweeping in her condemnation of fairy-tales in childhood. We must distrust the logic that would deprive our children of the joys in which we ourselves have revelled and bid us look askance at a wholly natural tendency. As Rusk says:

The proper defence of fairy-tales is that they form part of the literary heritage of a people and as such ought to be known; and it may well be that the early years of childhood, when the contradictions between the happenings of a fairy realm and those of a causally conceived world do not press heavily, may be the most suitable time for learning them.¹

¹ *The Doctrines of the Great Educators*, p. 287.

Moreover, since the child, as we have already noted, learns at quite an early age to keep his worlds of fact and fancy apart from each other, Montessori's arguments that he comes to expect superhuman aid at every turn, and that he is hindered from adjusting himself to the real world, are exaggerations.

She is, however, quite uncompromising in her attitude toward the fantastic imagination, on the grounds that its products are unreal and untrue, and that they impede the intellectual development of the child. What is her attitude toward the artistic imagination that finds its materials in the realms of fancy, but weaves them into a unified design? For, with such a narrow interpretation of the word 'truth,' a Shakespearean tragedy or any other great product of imaginative art would also be untrue. We have already seen that, although the details of fairy-stories are grotesque and absurd, their essence is a true picture of the child himself; similarly, it may be said of their more exalted counterparts in art that they embody profound truths about human nature, although they use fates, witches, and ghosts to bring them home to us. Deprived of the fantastic imagination, we should be deprived of many of the forms of the artistic imagination to which we are accustomed, and we should certainly have to revise drastically the dramas of Shakespeare himself.

Montessori believes that imaginative activity should be based on truth and reality, and that it will therefore find its proper materials in positive science. Lucretius long ago sang *De Natura Rerum*, and it is possible, perhaps probable, that a great poet will arise who will take as his themes the electron and the cosmos as described by modern science. But such a basis is clearly too narrow to embrace all art in its scope. In any comprehensive scheme of education there must be a place for the æsthetic imagination as well as for the pragmatic, which Montessori exalts so highly. The child faces two worlds—one of things outside himself, and the other his own inner world of thought and feeling. While agreeing, therefore, that he must conform to a real world, we insist that he must none the less be allowed to spend part of his time in an ideal world. Montessori does well to warn us of the dangers of unbridled fantasy; but,

if we give a sufficient part of his time to work that is exact, definite, and controlled by outside conditions, she ought to be satisfied. Let fact correct fancy and fancy correct fact.

The cultivation of the pragmatic imagination, however, is of great importance, for it is the imagination of the inventor and the scientific thinker. How can we foster this type of thinking? The doctrine expounded in this chapter—that perceptual and imaginative thinking are not different forms of mental activity, but the same process worked out at different levels—gives us a clue. Doing itself is a form of thinking, and it constitutes the indispensable basis for the higher stages of imaginative thought, which, in the last resort, are imaginative doing. The special form of imaginative thinking that we call reasoning is, as we have seen, imaginative experimenting. The old idea, then, that practical work is an occupation unworthy of the intellectual is totally wrong; doing and experimenting do not hinder the development of the power of abstract thinking, but aid it, and constitute, indeed, the only sure path to this desirable goal. In our doctrine we have psychological justification for the old teaching maxim, "Learn by doing," and a charter for embarking on many schemes of practical work in our schools.

Teachers of mathematics who despise practical work are building on sand; it was far otherwise that the intellectual stature of the Greek geometers was achieved. Even a 'pure' mathematician stands on the shoulders of others who have approached the subject from a more practical standpoint. It is the neglect of practical work in the early stages of mathematical teaching which causes the inability to pursue the study so common among students. Again, courses of mathematical physics pursued independently of the laboratory are little more than a juggle with symbols, resulting in graduates who are powerless to mend an electric bell or construct a wireless set. The doctrine of practical work holds good in all subjects: we saw earlier that there is a 'doing' element even in literary appreciation, and that in moral education the will is trained only by being exercised under suitable conditions. We must leave to the specialists the task of working out the doctrine in their own subjects, contenting ourselves here with the remark that,

if they will consider the ways in which these studies developed in the consciousness of the race, they will always find the inevitable substratum of actual doing. It is only by recapitulating this stage, following it up by a stage of imaginative 'doing' with concrete images, that they will develop, even in their more intellectual pupils, an effective power of abstract thought.

SUGGESTIONS FOR FURTHER READING

- McDOUGALL : *An Outline of Psychology*, chapter xv.
 NUNN : *Education : its Data and First Principles*, chapter xiv.
 SPEARMAN : *The Nature of 'Intelligence' and the Principles of Cognition*.
 DEWEY : *How we Think*.
 DREVER : *Introduction to the Psychology of Education*, chapter x.
 AVELING : *On the Consciousness of the Universal and the Individual*.
 MONTESSORI : *The Montessori Method*; *The Advanced Montessori Method*.
 RUSK : *Experimental Education*, chapters iii and iv; *The Doctrines of the Great Educators*, chapters viii and xii.

CHAPTER XIII

THE MEASUREMENT OF THE MIND

"You cannot be wise without some basis of knowledge; but you may easily acquire knowledge and remain bare of wisdom." Thus does Professor Whitehead call our attention to a distinction that has been recognized for long enough. Knowledge or erudition is the mere possession of facts, but wisdom is the added power to use and apply the knowledge which is at one's disposal. It is not knowledge of facts that we extol so much as the knowledge that these facts are relevant to certain situations. Wisdom has always been exalted far above knowledge. In many a story the stupid pedant is unfavourably contrasted with the smart, clever person who sees the meaning of things and can make a little knowledge go a long way. The simple hero of a legend performs feats that baffle the learned; and the king who was dubbed "the wisest fool in Christendom" was just one who had acquired learning without the power to use it.

Whenever educators have thought about the matter, they too have seen clearly that wisdom is the goal and that knowledge is only the means of reaching it. But in the history of education there have been many barren periods during which mere knowledge has been pursued as a desirable end in itself. At such times education has been a meaningless pumping in of facts. Popular education, for example, beginning as it did in an era of supreme intellectual achievement, aimed almost solely at producing people who knew facts: such facts were expected, in some mysterious way, to transmute base metal into gold, and to exalt their possessor to the highest heights of manhood. Grants to elementary schools were paid according to the results which could be assessed by His Majesty's Inspector with his test-cards. But gradually it was realized that the success of a school was not to be estimated by the number

of facts its pupils knew. Teachers were emancipated from the tyrannical system of payment by results, and were thus left gloriously free to cultivate what they called intelligence. About the beginning of the present century "intelligence became a cult and a quest and a watchword."¹ The pendulum swung away from exact knowledge, and teachers, in their zeal for cultivating smartness, forgot that we "cannot be wise without some basis of knowledge." They proclaimed that it did not matter whether their pupils knew anything or not; and their ideal seemed for a time to be the ignorant 'intelligent' person. Such a phase in popular education has definitely passed. Psychologists have shaken our faith in our power to cultivate intelligence: they have told us that we must regard it as a datum of education which we are powerless to increase. Perhaps, after all, our task is to increase knowledge, turning it into wisdom by providing opportunities for its exercise.

The work of psychologists on the subject of intelligence is clearly of vast importance for education, and its main conclusions ought to be known by every teacher. The problem is to measure the mind itself rather than the amount of knowledge it contains, and to state the magnitude of the mind in numerical terms. A body of knowledge becomes scientific only when it is quantitative as well as qualitative, for number is the soul of science. This is not to say that qualitative knowledge is worthless, as some enthusiastic devotees of modern science would have us believe. It may well be true that some aspects of mind will never yield to quantitative analysis. But clearly the quest for number in the realm of intellectual capacity is a worthy one, and by its pursuit psychologists have obtained some remarkable results. There is a trap, however, into which the unwary enthusiast for number may very easily fall. Numbers are sometimes used to state results which have no right to be so stated; and it cannot be too clearly realized that such a procedure does not make them scientific. All science is numerical, but all numerical results are not scientific. The acid test is, as every true scientist knows, the verification of results by other observers. Results must be objective, not

¹ Ballard, *Mental Tests*, p. 22.

subjective; that is to say, they must be quite independent of any opinion or bias the observer may possess. In mental measurement, therefore, what is required is a yard-stick for the mind which can be applied by any competent observer, always yielding the same results.

The measurement of knowledge, or mental content, is an ancient art, for its instrument, the examination, has been with us from early times. But the problem of modern psychology has been to devise a means of estimating mental capacity rather than content. One might think that the mind itself could be measured by knowledge—after all, the obvious way of measuring the size of a vessel is to find out how much it contains. But there are several objections to such a method. One person's opportunities of acquiring knowledge may be quite different from those of another: it would clearly be unfair, for example, to estimate innate mathematical ability by mathematical knowledge in the case of a person who, for one reason or another, has not learned mathematics. Again, if we use knowledge in mental testing we must be careful to test, not mere erudition, but the power to apply ideas in new cases.¹ Further, the relation between the mind and its knowledge is not that between container and content. Knowledge is not something in the mind, but rather the mind itself. "Fact becomes faculty," to use another of Adams' expressions. Just as food does not remain something in the body, but becomes the body, so properly assimilated facts become the mind.

The early mental testers discarded altogether the idea of using knowledge to measure the mind. They used rather the instruments with which they were already familiar—namely, those of physical science. These they could not apply to the mind, so they applied them to the body, hoping to find, in some bodily measurement, an index of mind. Now there was nothing absurd or unprecedented in such an attempt. In physical science it is the exception rather than the rule to measure anything directly; temperature and air-pressure, for

¹ Sir John Adams in one of his happy phrases has defined intelligence as "applied thought."

example, are measured by means of columns of mercury. The pioneers, then, looking round for some bodily characteristic which might give a vicarious measure of the mind, thought first of all of trying the head. Since the head is the home of the brain, which, in turn, is the bodily organ of the mind, it seemed reasonable to start here. So arose the science of phrenology.

At the close of the eighteenth century Gall and Spurzheim confidently taught that a careful study of the head would yield exact information about the mental qualities of its possessor. Their theory was not so crude as to state that a big head meant a big mind—idiots, after all, often have abnormally large heads. They directed attention rather to the relative proportions of the skull; and, since different mental functions are localized in different areas of the brain's surface, they thought that a knowledge of their development might be got from a study of the external surface of the cranium. That phrenology has by no means lost its hold on the popular mind is shown by the fact that professors of the art of reading 'bumps' are still able to make a living.

In 1775-78 Lavater published his essay on physiognomy, describing an even earlier attempt to estimate the mind from the body. Here the face was taken to be the index of a person's abilities and disposition. Lavater himself emphasized the importance of the features, but his followers stressed rather the facial expression. While most people would agree that some indications of character and disposition are to be obtained from a skilful reading of the face, they would hesitate nowadays to believe that the intellectual calibre is also to be found written there.

Another attempt in the same direction was made at the end of the nineteenth century by Cesare Lombroso, whose researches in criminology seemed to indicate that bodily stigmata, especially in the region of the head, were signs of defective intelligence and degenerate morals. Abnormalities in the shape of the skull, the forehead, and the nose, and a marked lack of symmetry in the face were interpreted as evidences of a tendency to revert to a lower and more primitive

level of humanity. But this doctrine is somewhat discredited nowadays, for we all possess to some extent these marks of degeneracy.

In fact, as Dr Cyril Burt says, "Psychologists are nowadays agreed in distrusting all snapshot judgments based upon an inspection of the face and head."¹ Such methods of investigation have not yet recovered from the researches *On the Relationship of Intelligence to Size and Shape of the Head*, published by Professor Karl Pearson in 1906. This investigator, from an examination of 5000 school children and 1000 undergraduates, concluded that no reliance was to be placed on such vicarious measurements of the mind—that no prediction of intellectual qualities could be made from physical features. "We cannot tell a criminal by looking at him; we cannot tell a genius by the shape of his skull; and we cannot tell a fool by the length of his ears."² Pearson reached his conclusion by means of mathematics, devising, along with Galton, a powerful mathematical method for drawing indubitable conclusions from masses of data. There is no space here to enter into it fully, but the general idea may perhaps be conveyed by the following example.

Suppose a number of people, whom we shall call $A, B, C, \dots X, Y, Z$, are tested for immediate memory, and an order of merit drawn up, A being first with mark a , B second with mark b , $\dots Y$ second last with mark y , and Z last with mark z . Suppose further that the same people are tested for prolonged memory and again a list drawn up in order of scores. It might conceivably happen that the order and the marks for the second test would be exactly the same as for the first, $A, B, C, \dots X, Y, Z$ having marks $a, b, c, \dots x, y, z$ in both tests. In this case we should have what is called perfect positive correlation between the two tests, meaning that from a person's score in the one we can infer exactly what his score will be in the other, or that the two functions tested are the same. It might also happen that the second list would turn out to be the first one reversed, Z having mark a , Y mark b , $\dots B$ mark y ,

¹ *Psychological Tests of Educable Capacity* (Board of Education), p. 4.

² Ballard, *Mental Tests*, pp. 6, 7.

and A mark z . This would be an example of perfect negative correlation, meaning that the goodness of a person in the one test is an exact measure of his badness in the other. A mathematical quantity, the coefficient of correlation R , is defined so that its value is $+1$ for perfect positive correlation and -1 for perfect negative correlation. In actual practice, of course, it varies between the two extremes, but its nearness to $+1$ indicates the amount of correspondence between the two characteristics tested. If it approximates to zero it indicates that there is no more correspondence than might be expected from chance. Thus, in our example, if R turns out to be zero we must conclude that from a person's score in immediate memory we cannot infer anything about his probable score in a test of prolonged memory.

It was by means of correlation coefficients, then, that Pearson decided that the amount of correspondence between intelligence and the size and shape of the head was extremely small. The attempts to measure the mind indirectly by means of static measurements of the body were definitely discredited.

The next stage in the history of mental measurement was characterized mainly by the use of brass instruments in the psychological laboratory. Galton, in 1883, suggested the possibility of finding simple laboratory tests which would measure intellectual ability; and psychologists, influenced no doubt by the traditional dictum of British psychology, *Nihil in intellectu quod non prius in sensu*, tried first of all simple tests of sensory discrimination. It was believed that the eyes, ears, and skin are much the same for all individuals, and that therefore the differences in the performance of sensory tests must be due to differences in powers of attention and discrimination—to an intellective factor, in other words. Colour was lent to this view by the discovery that Fellows of the Royal Society were much better than ordinary people at detecting small differences in weight. Another example of such sensory tests is the determination of the spatial threshold; that is to say, the minimum distance which must separate two sharp points applied to the skin to ensure their being distinctly

perceived as two; this is investigated by means of the æsthesiometer, an instrument something like a pair of dividers. But the hope that the spatial threshold might constitute an index of intelligence was not confirmed when it was found that savages had as sensitive skins as Europeans. As Ballard puts it,¹ to be thick-skinned is not the same as to be thick-headed.

When tests of the higher senses were tried it was found that the powers of discriminating shades of brightness and distinguishing the pitch of musical notes did correspond to some extent with intelligence; but such tests failed to provide the simple index of mental calibre which was sought. Tests of bodily powers, or motor tests, came as a reaction from the exclusive reliance of traditional psychology on sensation and intellect. It was thought that, since the mind co-operates in the activities of the body, a dynamic measurement might succeed where a static one had failed. Various instruments for measuring bodily powers were devised: the dynamometer measured the power of grip; the ergograph the strength and endurance of the middle finger; the tapping-machine the number of taps that can be made in a minute. Reaction-times too were determined, giving the interval of time that elapses between a stimulus and a response. But none of the motor tests was found to correlate highly with the intelligence of the subjects.

Although much valuable work was done in these directions, the main objective was not attained by the measurement of the body or its powers. Psychologists next turned their attention to the so-called 'faculties' or powers of mind, testing for memory, attention, association, and so forth. But still the single criterion of mental ability was not forthcoming. A severe blow, indeed, was given to the work on faculties by the negative results of the famous experiments on transfer of training. It was found that improvement of the memory, for example, in one field of exercise was not transferred to other fields. So far, then, from such tests of the faculties being found to correlate with intelligence, it was found that different

¹ *Mental Tests*, p. 10.

tests of the same faculty did not even correlate highly with one another.

Gradually it was realized that intelligence could not be measured vicariously by means of the simple bodily or mental operations, so the higher mental operations themselves were tried. Simple tapping, for example, was discarded in favour of a test which requires a high degree of volitional attention as well as motor dexterity. McDougall devised his dotting-machine, which exhibits an irregular row of circles in each of which the subject is required to put a dot. Even this task, involving as it does a large amount of mental energy, has been found more useful for investigations of fatigue than for those of intelligence. More and more psychologists sought to determine mental ability directly, using tasks which involve the use of the higher mental operations, such as the power to educe relations and correlates, and the power to reason. These tests, as we should expect from the preceding chapter, are real tests of the power to think; and their results are found to be highly correlated with independent estimates of intelligence by competent observers.

It was Alfred Binet, a French psychologist, who first provided the world with a workable series of intelligence tests. Confronted with the problem of diagnosing in children the degree of backwardness which constitutes mental deficiency and warrants removal to a special school, he too began his work by trying simple sensory and motor tests; but he soon recognized, like the English investigators, that he was on the wrong track. Something more complex, approximating more closely to actual intellectual operations, was needed. Believing that intelligence manifests itself in "purposive direction, active adaptation, and conscious correction," he recognized the need for a multiplicity of tests which would involve such forms of mental activity. So he rejected "the brass instruments of the band of German psychologists" and prided himself in requiring "no apparatus except pen, paper, and a little ink."

His labours resulted in the famous Metric Scale of Intelligence. To construct this he collected a large number of questions of a simple, conversational type, varying in character

and involving only information which would be readily 'picked up' by the ordinary child, independently of specialized opportunities for acquiring knowledge. When he applied these to large numbers of children he found that there was a minimum age at which most children could answer the various questions satisfactorily. He therefore classified his questions as 'belonging' to the various years of childhood. A question, for example, which could be answered by most children of six years but by very few of five was considered to be a suitable test for six-year-olds. In this way he was able to construct sets of questions for each year of school life. His 1911 scale consisted of fifty-four questions and tasks, five for each year from the third, the eleventh, thirteenth, and fourteenth years being omitted owing to a difficulty in finding tests that clearly belonged to them. He introduced the important conception of 'mental age'—the age whose tests a child can perform. Thus a child has a mental age of seven if he can completely pass the tests for age seven; if, in addition, he passed any tests for later years he was allowed one-fifth of a year for each. Binet solved his problem of diagnosing mental deficiency by saying that if a child was below nine a retardation of two years indicated deficiency; if he was above nine a retardation of three years was needed.

The success of Binet's direct attack on the problem of estimating intelligence made a great impression in the educational world, and enthusiasts in many countries sought to apply his scale. Constructed as it was to suit the case of Parisian street arabs, it is not surprising that it was found not altogether suitable for English and American children. Its lack of universality, however, is no defect, for its originator did not set himself to construct a scale which would be applicable everywhere. A more pertinent criticism is that the Binet scale is largely an 'all-or-none,' 'pass-or-fail' business. A child of six, for example, is not regarded as having a mental age of six unless he can pass all the tests for age six, regardless of what he can do for later years. Then, again, the criterion for mental defect is somewhat arbitrary: a retardation of two years at the age of eight is clearly less serious than the same retardation at

the age of five. Further, it is generally agreed now that all the tests are not equally satisfactory: catch-questions, for example, test suggestibility rather than intelligence. Had Binet lived, however, there can be no doubt that he would have continued his constant revision of the scale, probably on the lines pursued since his death by other workers.

In London Dr Cyril Burt translated the tests and modified them to suit the case of London children, re-allocating some to ages different from those of Binet. Other revisions were more drastic, notably that carried out by Professor Lewis M. Terman in America; but he also took Binet's tests as a basis for his work. His version eliminates some of the defects enumerated above. The Stanford revision, as it is called, contains ninety tests: six for each year from three to ten, eight for the twelfth year, six for the fourteenth, six for the average adult, and six for the superior adult, along with sixteen alternative tests. Again the ages eleven and thirteen are omitted, no doubt owing to the varying onset of mental adolescence during the years from eleven onward. Each test in the Stanford scale has an age value: those for the years three to ten, one of two months each; those for age twelve, three months; those for age fourteen, four months; those for the average adult, five months; and those for the superior adult, six months. Thus a boy of twelve years two months old who passes all the tests for age ten, five of the twelve-year tests, and two of the fourteen-year tests, has a mental age of 10 years + 15 months + 8 months, or 11 years 11 months. It will be seen that, according to the scale, the mental ages of an average adult and a superior adult are sixteen and a half and nineteen and a half years respectively.

Terman introduced many new tests, such as a test of vocabulary (which he regarded as very important) and the repeating of numbers backward. It is generally agreed that his scale is a great improvement on the Binet scale in the case of older children. For a criterion of mental defect he popularized the use of the 'intelligence quotient'; that is to say, the ratio of the mental age to the chronological age, usually multiplied by 100:

$$I.Q. = \frac{\text{Mental age}}{\text{Chronological age}} \times 100.$$

It is clear that the amount of backwardness is indicated more satisfactorily by this ratio than by the absolute difference between the mental and chronological ages. Terman attached the following meanings to the various values of the intelligence quotient:

Above 140	.	.	'Near' genius or genius
120-140	.	.	Very superior intelligence
110-120	.	.	Superior intelligence
90-110	.	.	Normal or average intelligence
80-90	.	.	Dullness, rarely classified as feeble-mindedness
70-80	.	.	Border-line deficiency, sometimes classifiable as dullness, often as feeble-mindedness
Below 70	.	.	Definite feeble-mindedness
50-70	.	.	Morons or high-class imbeciles
20 or 25-50	.	.	Imbeciles
Below 20 or 25	.	.	Idiots

One great drawback to the use of the Binet and Terman scales is the time required to apply them. This was not so serious when they were used for exceptional individuals only, but when their more general usefulness was realized it became necessary to find quicker methods. Mental tests were applied on a vast scale when America entered the War. Her psychologists, given the task of sorting out recruits into possible officers, non-commissioned officers, privates, and rejects, compiled series of written tests which involved the higher mental functions, and were independent, as far as possible, of specialized knowledge. These tests were applied to large numbers of people simultaneously, and their success was amazing. Psychologists thus acquired confidence in the 'group test,' which usually consists of a large number of short questions printed in the form of a booklet; the questions often have a number of alternative answers attached, from which the candidate is required to select the correct one. In England they have been used in scholarship examinations as

a means of estimating promise as well as attainment. Several sets are available, notably Dr Ballard's "Chelsea" and "Crichton" tests, and Professor Godfrey H. Thomson's "Northumberland" tests. It is possible to apply these and get preliminary results, at least, in quite a short time; but we are warned that the only safe and sure method is that of the individual tests.

A further objection to the Binet and Stanford scales is that the tests are predominantly linguistic in character, consisting as they do of verbal questions and verbal answers. The American psychologists, indeed, had to devise a second set of tests, the β -tests, to suit the case of illiterates. There are various performance tests suitable for use with young or backward children, such as the children of gipsies or of bargees, who, by their roving life, are deprived of the ordinary means of regular instruction.

There are certain broad, well-established results of mental testing. Of these perhaps the most general is that there is some intellective quality which can be tested, although it is not certain that this is identical with what the ordinary man calls intelligence. Further, the differences in this quality between one individual and another are too great to be ignored. Again, the intelligence quotient seems to be unaffected by schooling: to call anyone a 'born fool' is at least sound psychology if it is deplorable manners. The intelligence quotient remains practically constant throughout the years of growth; it is thus an innate characteristic of an individual, an absolute datum for the educator, a "primordial potency," to use the phrase of Spearman. Adams quotes the case of a boy at Twickenham of age six years and five months whose mental age was eleven years and seven months, giving an I.Q. of 180.5. Tested again a year later, his I.Q. was found to be 182. Such an isolated instance might fail to convince us were it not that several large-scale investigations have yielded the same result. The intelligence quotients of large numbers of children have been determined, and redetermined at longer or shorter intervals, and the correlations between the two sets of measurements found to be as high as .9. It seems certain,

then, that the same quantity is being measured each time, and that any slight variations are due either to inaccuracy of the measuring instrument, or to such accidents as fatigue and ill-health.

Another result, which, at first sight, seems even more astonishing, is that mental age does not normally continue to grow after the age of sixteen. Most adults are unwilling to believe that they are no more 'intelligent' now than they were at sixteen, and say at once that such a conclusion is ridiculous. The Binet tests, however, only went up to the age of fifteen, and, as we have seen, the mental age of an average adult on the Stanford scale is sixteen and a half. Dr P. B. Ballard, thinking that this might be due merely to the difficulty of devising satisfactory tests for adults, set about investigating the matter. If there was improvement after sixteen it ought to be evident in reasoning power; he therefore employed his absurdity tests.

His main difficulty was to secure comparable samples of people to whom to apply the tests. The ideal method would be to test the same sample of people year after year, but this it is practically impossible to do with a large number of subjects above the age of fourteen. Only the brighter pupils remain in school after fourteen; the age-groups get smaller, and their intellectual calibre tends to improve. Thus any improvement found in the intelligence of secondary-school children as they proceed up the school may be due to the gradual elimination of the less intelligent. However, in spite of difficulties, he applied his tests to about 2000 pupils in a variety of schools, ranging in age from eleven to eighteen, finding that the adults at a women's training college did no better than girls of sixteen at a secondary school, and that in secondary schools there was little improvement after fifteen and none after sixteen. These results, let it be remembered, were obtained with 'samples' which were weighted on the intellectual side in the higher age-groups. Spearman, too, found that naval cadets of fourteen and graduates gave the same results. The following table gives a 'pool' of all Ballard's results:

Age . .	11	12	13	14	15	16	17
Average score	13.1	14.4	15.1	17.4	18.5	18.9	18.9

It would seem probable that supernormals go on developing longer than average people, attaining their higher maximum at a later age; while subnormals attain their lower maximum at an earlier age.

As regards sex differences in intelligence, it has been found that, on the average, males and females are equally intelligent, but that there is a greater range of variability in the male sex. More males than females are found to have abnormally high intelligence quotients; but this is compensated for by the fact that more abnormally low ones are also found among males.

So far we have been assuming, as the earlier mental testers did, that we know what intelligence is. Mental-testing went on merrily for some time before anyone asked the awkward question, "What is intelligence?" Most people assumed the truth of what Spearman calls the monarchic doctrine, believing in the "sovereign rule of one great power"—intelligence—in all mental operations. Certainly the success of mental tests seemed to bear out the assumption that intelligence is an all-pervading mental power, which might be defined as 'conscious adaptation to new situations,' or 'inborn all-round mental efficiency.' If this view is correct we can infer that if a person performs one intellectual task well he will do others equally well. Some such assumption must underlie the practice of selecting candidates for the Higher Civil Service on the grounds of their proficiency in mathematics, classics, or philosophy. Dr Johnson seems to have believed in such a doctrine, declaring that Newton could have written a great epic if he had turned his mind to poetry rather than mathematics. To a critic who objected that one man might have better judgment or finer imagination than another he replied:

"No, sir, it is only that one man has *more mind* than another. He

may direct it differently ; he may by accident desire to excel in this study or in that. Sir, the man who has vigour may walk to the east, just as well as to the west.”¹

Nowadays, however, workers in the field of mental measurement have to face an attitude of criticism, even of hostility. Sceptics cast doubt on the very existence of intelligence, pointing out that none of the experts can say what it is. On several occasions eminent psychologists mobilized themselves to thrash out the question ; there was a symposium of British authorities in 1910, one of American in 1921, and an International Congress in 1923. But the efforts to decide the matter and to present a united front to the general public were unavailing : the discussions only revealed hopeless divergences of opinion among the psychologists themselves. They could not decide whether or not intelligence included memory, or imagination, or language, or attention, or motor ability, or sensation. In fact, as Professor Spearman says, it was found that ‘intelligence’ is a word with so many meanings that now it has none. “Words are wise men’s counters, but they are the money of fools.” If it is argued that we do not need to know what a thing is before we measure it, as in the case of electricity, Spearman rejoins that we must know with which galvanometer the electric current is in circuit, and we do not know whether memory, for instance, is in circuit with intelligence. Again, it is no argument to say that intelligence-testing works, for it has been made to work with the judgments of teachers and others. Even if the monarchic doctrine is true the fact remains that to measure intelligence in practice we split it up. In spite of the initial enthusiasm, then, the monarchic view gives no clear idea of what intelligence is, and constitutes a very uncertain theoretical basis for mental-testing.

All psychologists, however, have not subscribed to the monarchic view. The “oligarchic doctrine,” as it is called by Spearman, teaches that our mental capacity consists not of one, but a few great powers, each requiring separate measurement ; the result being a sort of ‘mental profile’ of

¹ Boswell, *The Journal of a Tour to the Hebrides* ; quoted in *Psychological Tests of Educable Capacity*, pp. 14-15.

the individual. Binet, as we have seen, found three separate manifestations of intelligence.¹ The oligarchic doctrine was crystallized in the older 'faculty' psychology which was rendered obsolete by the work of the experimentalists. The usual objection to the faculties—that they contradict the unity of the mind—need not necessarily hold, unless they are hopelessly hypostatized. In fact, to quote Spearman² once more, "faculties have a way of losing every battle, but always winning the war." The doctrine "will bend to the slightest breath of criticism; but not the most violent storm can break it." When one set of faculties goes down like ninepins, up springs another set like mushrooms. Yet the existence of the traditional faculties, such as judgment, attention, and memory, is extremely doubtful; different tests of judgment, for example, do not correlate highly with one another. There would seem to be no sure foundation for the oligarchic doctrine, that ability consists of a few major faculties, each of which functions by itself and is capable of being measured by a single value.

Since the 'monarchic' intelligence has to be broken up to be measured, some have gone further than the doctrine of oligarchy, asserting that there is only anarchy. That is to say, all abilities are independent of one another, and no inference at all can be made from performance in one to performance in another. A person's 'general intelligence' is the average of his several abilities, and is measured by sampling. Support for the anarchic doctrine is found in the current practice of mental-testing, it being generally agreed that a miscellany of tests, varying in character, is required. But to offer such a doctrine as a theoretical basis of mental measurement is clearly unsatisfactory. How are we to decide which abilities should constitute the sample? Ought memory to be included? Or motor ability? Then again, Are all the constituents of the sample equally important? For, if not, taking an average cannot be a valid proceeding. Can we be certain that in our sample we have no abilities overlapping or repeating one another? For, if we have, such abilities would weigh too much in the average. Further, if the

¹ See p. 226.

² *The Abilities of Man*, p. 38.

abilities are really independent an average must be meaningless. Quantities whose average is taken must be different variants of the same thing. We might as well take an average of a man's height and his weight. There is no known principle of sampling mental abilities. But few now subscribe to the doctrine that the abilities are entirely independent.

Professor Spearman himself, as a result of an elaborate series of researches extending over many years, has put forward his now famous doctrine of two factors. He has shown that if the results of various tests of mental abilities are correlated with one another, a remarkable relation holds among the correlation coefficients. If a, b, p , and q denote four abilities, and $r_{ap}, r_{bq}, r_{aq}, r_{bp}$ the coefficients of correlation between the various pairs denoted by the suffixes, then

$$r_{ap} \times r_{bq} - r_{aq} \times r_{bp} = 0.$$

This relation he calls the tetrad equation, the quantity on the left being the tetrad difference; and it is well to remember that the truth of the equation depends, not on theory, but on experimentally observed fact. Now, when the tetrad equation is satisfied, as it frequently is, it follows mathematically that every individual measurement of each ability in question can be divided into two parts: (1) g , the general factor, remaining the same for any one individual in respect of all his correlated abilities, and (2) s , a specific factor, varying in the same individual from one ability to another. That is to say, g , the central factor, varies from one individual to another, but is constant for any one individual in all his scores; while s , the specific factor, varies from one individual to another, and in any one individual varies also from one test to another. A person's score in a test, then, consists of two parts, one proportional to his 'general factor,' and the other proportional to his 'specific factor' in that particular ability. Expressed in the shorthand of algebra,

$$M_{ax} = r_{ag} \cdot g_x + r_{as} \cdot s_{ax}$$

where M_{ax} = score of person x in test a , g_x = general ability of person x , s_{ax} = special ability of person x in test a , and r_{ag}, r_{as} are constants, independent of x .

Any mental test, then, measures g and one s , some measuring g predominantly, others an s predominantly. Tests of retentivity, for example, are found to be surprisingly independent of g . It follows that from a person's ability in one direction some inference as to his ability in another can be made, the amount depending on how much g is involved in both. g is obtained very roughly in current testing by the method of pooling, for the tests are selected by reason of their high correlation with one another.

The question arises, Is the tetrad equation, which is the basis of the doctrine, always satisfied? The answer is "No." Errors of sampling are bound to occur, giving the coefficients of correlation false values, but means have been found for estimating the effect of this on the tetrad difference. Sometimes, even when due allowance has been made for sampling errors, the tetrad difference does not assume zero value; this is because all the specific factors are not independent, but occasionally overlap one another. Abilities in Latin grammar and Latin translation, for example, have a certain amount in common. The tetrad equation, indeed, furnishes a means of testing whether abilities are independent. Cases of overlap do occur, and have led Spearman to the discovery of group factors, those which come into more than one, but less than all of a given set of abilities, indicating kinship among the abilities in question.

Spearman calls his doctrine of the two factors "eclectic," because it includes the amount of truth in each of the three already described. The monarchic view is justified if we regard g as a constitutional monarch, a big factor in the state, but not the sole one. The anarchic view holds with the specific factors, for they are like free, independent, individual citizens. The oligarchic view is true to the extent that 'faculties,' distinct from the universal factor, and fairly distinct from the specific factors, are revealed in the broad 'group' factors.

What is g ? The certainty that it exists does not tell us its nature. Modern physicists tell us that they can say nothing about the nature of the reality that lies behind their mathematical symbols. Similarly, g is a mathematical quantity

which Spearman has always refused to identify with 'intelligence' as the ordinary man understands it. It is at least certain, however, that it has much to do with intellectual performances of all sorts. Spearman is inclined to the view that it must be identified with mental energy, really an ultimate hypothesis; that it is "some force capable of being transferred from one mental operation to another different one."

Mental tests, then, would appear after all to measure an important intellective factor. Does this conclusion mean that they are infallible in diagnosing the potentialities of an individual? Clearly, no! Character and morals are left out in any determination of intelligence; and it cannot be said that the affective-conative side of the mind has so far yielded to the methods of experimental psychology. Yet psychologists have been persevering in the task of investigating temperament and will, and a certain amount of success is attending their efforts.

One method used is that of word-associations, devised by Jung, and now an important part of psycho-analytic technique. The subject is given stimulus-words, and asked to respond with the first word that comes into his mind, the time of reaction being taken with a stop-watch. When the reaction-time is unusually long, or the response unusual, the existence of a repressed complex is suspected by the psycho-analyst. But the method is useful also for exploring the mental content and the various interests of the individual. Another method is that of the psycho-galvanic reflex. It was discovered accidentally by Müller, a Swiss engineer, that when one is in an emotional state the resistance offered by the body to an electric current is temporarily lowered; such diminution of the resistance seems to be proportional to the intensity of the feeling. Psychologists have found this a feasible method of investigating emotional susceptibility, and have used it successfully, either alone or in combination with the word-association method.

Character and temperament are usually assessed by means of reports and interviews. But Dr E. H. Magson¹ has proved that

¹ *How we Judge Intelligence* (*Brit. Jour. Psych.*, Monograph Supplement, No. 9).

there is very little correlation between the interviews and the differentiated estimates of sense of humour, cheerfulness, quickness, and profoundness;

and that

the interview can only be claimed to be a means of measuring 'personal qualities,' i.e., it affords an opportunity for the judges to estimate how far the subject possesses the power of impressing other people.

Dr E. Webb,¹ in a well-known piece of research among training-college students, got estimates of some forty-eight mental qualities, the judges being college prefects. From an analysis of his data he discovered the existence of a general factor, independent of g , and concerned rather with purpose and will-power. This he named w , or "persistence of motives." Later on Dr Maxwell Garnett, using the same data, discovered a third factor, c , or cleverness, closely allied to a sense of humour and originality. It is clear that the notions of w and c as further independent variables greatly add to our power of describing the potentialities of an individual. The genius must have high c as well as high g , and, unless he has high w as well, he will achieve little but desultory brilliance. High w combined with ordinary or low g and low c gives us the plodder; high g and w with low c the solid intellectual worker who does not 'sparkle.' We are all variously endowed in respect of these three factors.

The science of mental measurement has made sufficient progress for a few educational corollaries to be drawn with some confidence. The educator must, first of all, reckon with the constancy of the intelligence quotient, accepting the fact that he is powerless to alter it. But although he cannot generate intelligence in his pupils, as his optimistic predecessors tried to do, he need not adopt a fatalistic attitude and think that his task is in vain. For, clearly, the provision of material and opportunity for the effective exercise of intelligence, and the training of the child to make the greatest possible use of his innate intellectual endowment, will give

¹ *Character and Intelligence* (*Brit. Jour. Psych.*, Monograph Supplement, No. 3).

ample scope for the energies of the ablest and most conscientious teacher. The educator has to remember, too, that g does not constitute the whole of his pupil's endowment; that the proverb "Where there's a will there's a way" is to some extent true of intellectual achievement. Success is possible to the youth or maiden who, endowed with moderate g only, is determined to perform intellectual tasks. In short, the fact of g does not spell absolute determinism in education. Yet, when all this is admitted, it seems undeniable that intellectual careers are not possible to all; that many who seek to pursue them are paying too great a cost, and would be spending happier and more useful lives in less intellectual occupations.

We have seen, too, that individual differences in intellectual capacity are too great to be ignored. This has an important bearing on the ordinary work of the school, where we are expected to teach a considerable number of children at once. Now, not only do mental tests provide us with a reliable means of examining whether backwardness is due to circumstances or to innate defect, and, in the latter case, whether the defect is sufficient to justify removal to a special school; they also teach us very definitely that even our 'normal' pupils differ in intellectual endowment, and that it is idle to expect them to proceed at the same rate or to perform the same amount of work. It is just as important to know which of our pupils have high intelligence quotients as to know which have low. The old idea of teaching the 'average boy' in the class must go: there is no such boy, and even if there were the pace would be too fast for some, too slow for others. The solution of this difficulty lies in a large measure of individual work. Although certain class-lessons are necessary and desirable, we cannot proceed on the assumption that a class can work all the time as a collective unit. But everywhere enterprising teachers, recognizing the variability of intellectual endowment, are organizing their work accordingly.

Again, the I.Q. ought to become a recognized basis of differentiation when children end their primary education at the age of 11+. Pupils for grammar schools and selective modern schools should undoubtedly be chosen on account of

their ability to profit by the type of education there offered; and the paramount factor in such ability is intellectual endowment. Many educational authorities, realizing this, have included a mental test in their scholarship examination, or have imparted to that examination something of the character of a mental test. The criterion of intellectual suitability, however, should apply not merely to scholarship children. One may be permitted to look forward to the day when the ability to pay fees, which are a mere fraction of the real cost, will not admit a child to a grammar school.

The post-primary schools, in turn, must recognize the existence of the special abilities. The belief current among teachers that some pupils have natural linguistic ability, others mathematical, has a sure foundation in fact; and, although premature specialization is to be deprecated, such pupils should be allowed to follow their bent so far as is consistent with their receiving a sound general training. Especially must the modern schools recognize the existence of the special abilities in directions not so intellectual. It is their task to discover such abilities, and to encourage their pupils to find self-realization in developing them. Nor need it be an idle hope that young people in the future, having found their permanent interests during their school careers, may be able to pursue those interests in occupations which will enable them to avoid the fate of square pegs in round holes.

SUGGESTIONS FOR FURTHER READING

- BOARD OF EDUCATION : *Psychological Tests of Educable Capacity*.
 BALLARD : *Mental Tests ; Group Tests of Intelligence ; The New Examiner ; "The Limit of the Growth of Intelligence" (Brit. Jour. Psych., October 1921)*.
 ADAMS : *Modern Developments in Educational Practice*, chapters iii and iv.
 BINET : *Les Idées modernes sur les enfants*.
 SPEARMAN : *The Abilities of Man*.
 TERMAN : *The Measurement of Intelligence*.
 BURT : *Mental and Scholastic Tests*.
 SANDIFORD : *Educational Psychology*, chapter viii.
 NUNN : *Education : its Data and First Principles*, chapter ix.
 YOAKUM and YERKES : *Mental Tests in the American Army*.
 RUSK : *Experimental Education*, chapter xii.

CHAPTER XIV

THE TYPE IN EDUCATION

QUICKE wittes, commonlie, be apte to take, unapte to keepe : soone hote and desirous of this and that : as colde and sone wery of the same againe : more quicke to enter spedelie, then hable to pearse farre : even like over sharpe tooles, whose edges be verie soone turned. Soch wittes delite them selves in easie and pleasant studies, and never passe farre forward in hie and hard sciences. . . . Hard wittes be hard to receive but sure to keepe ; painefull without werinesse, hedefull without wavering, constant without new fanglenes : bearing heavie thinges, though not lightlie, yet willinglie ; entring hard things, though not easelie, yet depelie : and so cum to that perfittnes of learning in the ende, that quicke wittes, seeme in hope, but do not in deede, or else verie seldome, ever attaine unto.

In these wise words Roger Ascham, the private tutor of Queen Elizabeth, brings to our notice the question of the type in education. Long before the days of experimental psychology his experience of teaching enabled him to distinguish two broad types of pupil : for him there was no 'average pupil' or 'typical child.' Such expressions, indeed, are more characteristic of the first half-century of popular education, and represent the first tentative solution of the problem of teaching large numbers of children at once. We are familiar, too, with the choleric, sanguine, melancholic, and phlegmatic types of the medieval thinkers, who, like every one else, seemed to share the inveterate tendency to attach such labels to their fellow-creatures. What has modern psychology to say on the subject?

Psychologists of to-day certainly do not believe in the existence of the 'average child,' for all investigations have revealed striking differences between individuals. Many, however, claim, like Ascham, to have found types. The individual differences, they say, fall into groups sufficiently distinct from one another to constitute types. Such a theory of

'multiple types' is really one form of the oligarchic doctrine described in the previous chapter, but it extends beyond the sphere of mere intellectual ability. Let us look at some of the alleged types.

In our study of attention we saw the intensive and distributive types, the fixating and the fluctuating, the static and the dynamic. In memory we had the sure retainer and the quick memorizer; in this sphere, too, we have the 'perseverator'—the person whose experiences "remount into consciousness spontaneously"—and the non-perseverator. Now we are told that some of the above types persist beyond the range of a single 'faculty'; thus there are 'static' people who persistently pursue a purpose, and 'dynamic' people who need continual spurring in accomplishing any task. Although the actual names may carry but little conviction, the implied distinction is clear enough. Similarly, the distinction between 'intensive' and 'distributive' appears again in that between 'deep-narrow' and 'shallow-broad' types of people. Stern, in an interesting investigation on testimony, discovered 'objective' and 'subjective' types, the former giving a report that is matter-of-fact and characterized by objective fidelity, the latter one that is more characteristic of themselves than of the object described. Again, Meumann and Stern tell us of 'analytic' and 'synthetic' types of people, the analytic regarding details in isolation from one another, observing clear lines of demarcation, and correcting errors; the synthetic bringing together what is separate, creating 'unity in diversity,' neglecting actual details. Stern too finds 'spontaneous' and 'merely reactive' types of people—those who attack mental work of their own accord, and those who require an external stimulus.

We need not multiply instances of the alleged types—there is no end to them. Differences in imagery, however, are sufficiently important to justify brief description here. There are those whose imagery is concrete, who do most of their thinking by means of primary memory-images. When this concrete imagery is extremely vivid, the images almost assuming the character of actual perceptions, the type is called 'eidetic.' Frequently the imagery of young children is found

to fall into this category. Others use verbal imagery, thinking by means of word-symbols. But again the verbal type may be divided into the sub-types—visual, auditory, and motor.

Perhaps more fundamental than any of the above are the famous types of Jung—introvert and extrovert. In order to understand this, the most successful form so far of the doctrine of types, we may profitably come back to Drever's description of experience as a meeting-ground of inner and outer factors which synthesize or fuse with one another.¹ The outer world gives rise to sensations to which the mind, from its own inner resources, contributes meaning, the result being perceptual experience. The object of thought comes from without, while the form comes from within. Now one person may habitually stress the inner factor in his mental life, and another the outer: the former we call an introvert, the latter an extrovert.

Thus the introvert is one who is concerned not so much with things in the outer world as with his own thoughts and feelings; he stresses the subject rather than the object of experience, and finds "within himself the unconditioned value." The extrovert, on the other hand, concerns himself with objects as such, stressing the object rather than the subject of experience, and finding "the unconditioned value outside himself."

Jung is more difficult to follow when he goes on to distinguish four types each of introverts and extroverts; but his initial broad distinction is clearly borne out by ordinary experience. In the circle of his acquaintances the reader can probably find quite pronounced examples of either type. We certainly find them clearly marked in that great psychological document, the Bible. Mary of Bethany was a pronounced introvert, while Martha, her busy, bustling sister, was equally a pronounced extrovert. Again, the writer of the Fourth Gospel was an introvert who, in telling a story, insensibly passed off into his own reflections; while the Synoptists were extroverts who merely recorded events as they believed them to have happened. The same contrast holds between the Eastern and

¹ See Chapter II.

the Western mind: indeed, Kipling's dictum that "East is East and West is West, and never the twain shall meet," takes on a fuller meaning in the light of this doctrine. The Western mind, absorbed as it has been in the advancement of physical science, finds it difficult to understand the more contemplative Eastern mind and to appreciate its values. It is very difficult for the two types to understand each other, for there is no bond of sympathy between them. We in the West are accustomed to say that the extrovert is one who adapts himself to the 'real' world; but surely the inner world of thought and feeling is just as 'real' as the physical universe, and possibly more so. And although the extrovert, by his very nature, is more successful in dealing with the world of men and things, the introvert has an equal right to exist. It is, indeed, possible that his power of reflection may, in the long run, be of greater ultimate value than the practical efficiency of the extrovert.

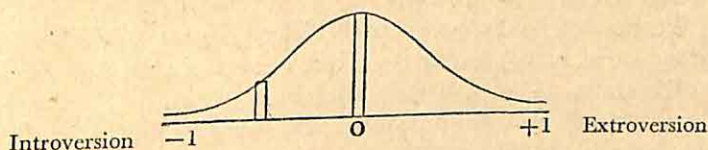
It is probable that we begin our lives with a tendency in the one direction or the other, but the circumstances of life, particularly in early years, may easily modify our original natures in this respect. A wise education will aim at preventing extreme development of either type.

Most of the investigators whose results we have outlined agree with Jung in announcing two sharply contrasted types of people; moreover, the types of the different investigators, though not identical, appear to have a certain amount of kinship with one another. If the student were to draw two columns, heading them 'Introvert' and 'Extrovert' respectively, he might easily discover that, for most of the contrasted types, the one column rather than the other would be more suitable. Thus, for example, he would be inclined to put 'subjective' and 'deep-narrow' under 'Introvert,' and 'objective' and 'shallow-broad' under 'Extrovert.' This would seem to indicate that the results of experiments from widely differing standpoints all point to some one fundamental distinction in our mental life. There may be some quality, the possession or the lack of which determines the type to which we shall belong; but the nature of that quality is quite uncertain, and, in the present state of our knowledge, it would

seem wise to adhere to the explanation of the introvert-extrovert distinction in terms of the dual subject-object aspect of experience.

How far is it true to say that an individual must belong either to the one type or to the other? In spite of the remarkable consensus of opinion, psychologists, when challenged, fail as a rule to produce clear examples of their pure types. Thorndike has been very sceptical, contending that the variations among individuals are so gradual and continuous that they do not admit of rigid classification into types. "There is only one type, the mediocre," he says; that is to say, the only thing that can be called a type is the central tendency around which all variations cluster. The truth would seem to be that most individuals are neither the one thing nor the other, that most of them are near to the mean, and that examples of an extreme type are comparatively rare. In qualities such as introversion and extroversion it is quite likely that the law of normal distribution is followed.

Suppose we could collect a large number of individuals and test them exactly for their degree of introversion or extroversion. Suppose further that we drew a straight line, labelling its ends -1 and $+1$ to indicate extreme introversion



and extreme extroversion respectively, and its mid-point 0 to indicate no tendency in the one direction more than in the other. On such a scale $+5$ would indicate a fairly pronounced extrovert, while -3 would indicate a less pronounced introvert. Now, if above each segment of such a scale, *e.g.*, -3 to -2 , we erected columns whose height was proportional to the number of cases we found exhibiting the corresponding degree of introversion or extroversion, our diagram would probably approximate to the well-known bell-shaped curve of normal distribution, as in the diagram.

The fundamental fact of agreement, however, between the upholders and the opponents of the 'type' theory stands clear. Individual differences are too great to be ignored, and we cannot successfully mete out 'average' treatment to all sorts of people. Psychology took a great stride forward when its professors forsook the armchair for the laboratory and established the existence of individual differences; and none of its findings has more profoundly influenced the practice of education. It matters little whether or not the variations are sufficiently clear-cut to be catalogued into types, or whether they merge imperceptibly into one another. For few now would accept the educational corollary once offered by the 'type' psychologist—that we should classify our pupils according to the types to which they belong. Such a course, besides being impracticable, would almost certainly be undesirable. In some ways, no doubt, it might be advantageous to have the pupils in a class all belonging to one type, say of imagery; but no one would seriously contend that all introverts should be herded together and so made more introverted than ever. Introverts and extroverts will be the more enabled to see one another's point of view, and to realize that both have a contribution to make, if they are encouraged to mix freely.

We must, in fact, give up the idea that we are teaching, or ever can teach, a class: we can only teach the individuals in the class. And, like Roger Ascham, we must "discretely consider the right disposition of their natures." To this end teachers have fought, and fought successfully, for smaller classes. The number of pupils entrusted to the care of one teacher should be sufficiently small for him to know them as individuals, for without such knowledge he may be setting tasks that are congenitally impossible to many of them. The real solution of the difficulty is not classification according to types, but individualized instruction, as in the Montessori method and under the Dalton plan, the success of which is beyond doubt.

We can hardly leave the subject of types without some reference to the vexed question of co-education, for the

broadest and most pronounced difference that we find among our pupils is undoubtedly that due to sex. In the previous chapter we saw that there is no difference in average intelligence between the two sexes: mental measurement, therefore, affords no adequate reason for segregating the sexes in education. But undoubtedly, since the interests of the two sexes diverge considerably, different lines of appeal must frequently be adopted. This fact, however, does not in itself justify segregation, for again such a difficulty in instruction can be met by the adoption of individual methods. Whether or not co-education is a good thing must be decided, not by psychology, but by a consideration of the social aspects of education.

The doctrine of individual differences, then, has profoundly affected educational theory so far as instruction is concerned. Each individual pupil must pursue the path of learning for himself, receiving such aid from the teacher as is suited to his individual requirements. But this does not mean that the class should be abolished. Enthusiasts for the Dalton plan find it expedient still to give a number of class-lessons which provide instruction that is needed by all. And even if this were not the case there are potent reasons for preserving the integrity of the class as a social unit: these we shall seek to expound in our concluding chapter.

SUGGESTIONS FOR FURTHER READING

ASCHAM : *The Scholemaster*.

RUSK : *Experimental Education*, chapter xi.

SPEARMAN : *The Abilities of Man*.

MCDUGALL : *An Outline of Abnormal Psychology*, chapter xxviii.

NUNN : *Education : its Data and First Principles*, chapter ix.

JUNG : *Psychological Types*.

CHAPTER XV

THE PSYCHOLOGY OF THE GROUP

IN the last two chapters we have been studying a branch of psychology which has led us to advocate individual methods of instruction. Throughout the centuries, too, we find most of the classical educational theorists expounding a scheme of education for an individual. We might be in danger of supposing that the school and the class exist merely because it is impracticable to provide each child with a private tutor, and that the only child of a rich millionaire, who is of too fine clay to mix with his fellows, is receiving an ideal education. The general opinion, however, that such is not the case has now behind it an important body of psychological principle of which we shall proceed to examine the main outlines.

Collective psychology is a natural result of the extended definition of psychology which we accepted in our first chapter. So long as psychology was merely the study of individual experience, no principles relative to the group were likely to be formulated; but when it began to be regarded as the study of behaviour it gradually included within its scope every organism that exhibits a characteristic mode of behaviour. The crowd is certainly such an organism, for its modes of action, feeling, and thought are characteristic of the crowd as such rather than of the individuals who compose that crowd. Thus, as a consequence of the 'behaviour' definition of psychology, we have to-day a psychology of the social group.

Now, of course, all who have successfully dominated their fellow-men—all outstanding demagogues, orators, and leaders—have been at least implicitly acquainted with the principles of collective psychology. Shakespeare too knew well the subtle art of suggesting ideas to a crowd and working up mob emotion; the speech that he puts into the mouth of Mark

Antony, for example, shows that he had little to learn from modern books on the subject. Such books constitute a recent attempt to make explicit those principles that have hitherto been implicit. They have not been written from an educational standpoint. Some writers have been chiefly concerned to account for the fact that people in crowds frequently fall below their normally accepted standards of thought and conduct. Gustave Le Bon studies the crowd because he realizes that "the voice of the masses has become preponderant." Trotter's study *Instincts of the Herd in Peace and War* was stimulated by the Great War, while McDougall's *Group Mind* is national in its outlook. We shall see, however, that many of their conclusions are directly applicable to the conditions of school life, and that they afford valuable suggestions for the solution of many educational problems.

Now every collection of people does not constitute a psychological group, the essential character of which is well brought out by the following example drawn from the pages of McDougall:

There is a dense gathering of several hundred individuals at the Mansion House crossing at noon of every week-day; but ordinarily each of them is bent upon his own task, pursues his own ends, paying little or no regard to those about him. But let a fire-engine come galloping through the throng of traffic, or the Lord Mayor's state coach arrive, and instantly the concourse assumes in some degree the character of a psychological crowd. All eyes are turned upon the fire-engine or coach; the attention of all is directed to the same object; all experience in some degree the same emotion, and the state of mind of each person is in some degree affected by the mental processes of all those about him.¹

The fundamental condition of collective mental life is that the members of the group should act, feel, and think together.

One thing is certain—the thinking, feeling, and acting of the group as a whole are different from the normal thinking, feeling, and acting of the individuals who compose it. Further, it would be a profound mistake to suppose that the former are the sum or average of the latter. Collective modes of action,

¹ McDougall, *The Group Mind*, pp. 22, 23.

feeling, and thought are frequently on a much lower level than individual modes: they may also be on a higher level. In a crowd individuality is damped down: it is difficult for individuals to realize themselves as members of a mere crowd, although doubtless the higher forms of social group enable them to do so. Certainly the collective modes of being conscious must proceed in some mysterious way from the individual modes, but they are in the nature more of a resultant than a sum or average of these modes.

The fact is that "where two or three are gathered together" new forces are at work, welding the individuals into a new organism. Such forces, no doubt, reside in individual minds, but they need the presence of others to bring them into play, and are meaningless apart from their social reference. What are these forces?

Certain of the instincts themselves have a social reference. Clearly the gregarious impulse is the first force that brings the social group into being. Then the instincts of self-assertion and self-abasement have no meaning apart from society. Given the gregarious instinct to begin with, it is these two powerful adjuncts to it which bring about the organization of the social group. Just as the different cells in the body take on specialized functions, so, when a collection of individuals becomes a social organism, different people, under the sway of the instincts of assertion and submission, assume the rôles of leader and led.

The principal factor in producing the crowd effect may be comprehensively termed 'mimesis,' to use the word suggested by Sir T. Percy Nunn. Under mimesis we include all forms of imitation—of feeling, of thought, and of action. Sympathy, suggestion, and imitation, indeed, are manifestations of the gregarious instinct in feeling, thought, and action respectively, and in them we have the inevitable triangle of collective consciousness. Let us examine them separately.

Sympathy is, literally, feeling with others. When two or more people are together an emotion experienced by one tends to be transferred to the others. In order to account for this phenomenon some postulate a hypothesis of telepathy,

supposing that one mind can directly induce in another states of consciousness similar to its own. With regard to such a hypothesis judgment must be reserved; there is considerable evidence of genuine telepathy between close friends and near relatives, but scanty evidence that the power is normally possessed. In order to explain the sympathetic induction of the emotions in the members of a group, however, there is no need to have recourse to telepathy, for McDougall's principle of "primitive passive sympathy" is sufficient. Our instincts seem to be organized on the afferent side in such a way that they are unlocked by the perception of instinctive behaviour in another. Thus my instinct of fear becomes active if I perceive the outward signs of fear in another person, the result being that I too experience the fear. When one small child begins to cry his distress is soon shared by his companions. This primitive passive sympathy is unwitting; that is to say, the feeling is induced without the individual realizing what is happening. In collective life sympathy is of outstanding importance. While it takes place readily with two people, in a crowd it is cumulative in its effect, especially if some outstanding individual is in a pronounced emotional state and shows it. Then we have real mob panic and mob anger.

The power to share the feelings of others is a most potent force for welding a number of individuals into a social group, and its importance in school life cannot be over-estimated. The person from whom a gift of sympathy is withheld should not become a teacher. Not only will he be incapable of seeing the point of view of his pupils, but he will be unable to assume his proper position in the social group.

Just as we can share the feelings of our fellows, so we can share their thoughts. Here we must recognize a clear distinction between the witting acceptance of ideas, as in consciously following an argument, and that unwitting process which we call suggestion. McDougall defines suggestion as "a process of communication resulting in the acceptance with conviction of the communicated proposition in the absence of logically adequate grounds for its acceptance."¹ The process

¹ *An Introduction to Social Psychology*, p. 97.

is unwitting on the part of the person receiving the ideas, although it may be quite deliberate on the part of the person suggesting. The person to whom ideas are suggested thinks that they are his own, never dreaming that they come from an outside source. Suggestion may be regarded as the cognitive aspect of the gregarious instinct. The classical example of the power of suggestion is to be found in Shakespeare's *Othello*, when Iago, while seeming to defend Desdemona, is deliberately suggesting evil thoughts of her in the mind of Othello. The witches in *Macbeth*, too, are an incarnation of the power of suggestion. But it must not be imagined from these examples that suggestion is potent only for evil, although the usual meaning of the word 'suggestive' as applied to a story or a picture might also lead us to think so. Suggestion is a force as powerful for weal as for woe.

Although Shakespeare knew all about this trait in the human mind, it is only comparatively recently that psychologists have given it their attention—perhaps because an intellectualistic psychology could give no satisfactory account of it. It was studied first in connexion with hypnotism. In the hypnotic trance the subject very readily accepts ideas from the hypnotizer, and is quite ignorant of the source of such new ideas when he regains his normal personality. Thus it has been found effective to hypnotize a person and to suggest to him that he can easily do certain things which in his waking state he thinks he is powerless to effect. The subject, not suspecting that such ideas have not originated in his own mind, is all the readier to act upon them. An even more remarkable phenomenon is post-hypnotic suggestion. If, during a hypnotic trance, a person is told that at a certain time in his waking state he will perform such and such an action, he carries it out at the exact time, inventing trivial and unconvincing reasons for doing it, trying to justify it to himself as well as to the onlookers. These phenomena are difficult of explanation, and make us realize our extreme ignorance of the nature and powers of mind.

By means of simple experiments the student can study suggestion, and estimate the suggestibility of various people,

qualitatively at least. One such is the following. The experimenter asks the subject to hold in his hand a coil of wire, which is to be heated by switching on an electric current. He tells the subject that he is testing the sensitivity of his skin to slight differences in temperature, and asks him to report when he feels the wire getting warmer. It is found, even with adult students, that many report a change in temperature when the current is not actually switched on, but only appears to be so. Young children are much more suggestible than adults.

What explanation of suggestion can we offer? In the mind of the person who is unwittingly accepting ideas from another the energy behind the process comes from the instinct of submission. If one person adopts an attitude of deference to another he will readily accept his beliefs, opinions, and attitudes—and this is true of all suggestion, whether in hypnosis or in the normal waking state. We are all prone to accept suggestion from persons in authority, from persons whom we admire, and from the printed page. This explains why children and people who have never learned to think for themselves are so suggestible.

Now the teacher, being older, more experienced, and in a position of authority, has great power to make suggestions to his pupils. What use is he to make of this power? We shall take it for granted that the teacher is a man or woman of high moral character, and incapable of deliberately suggesting evil. We merely observe in passing that suggestion is a process so subtle that any attempt to suggest ideas in which the teacher does not sincerely believe is bound in the long run to fail. It is clear that the teacher ought not to exploit his power to suggest his own religious or political creed, since he is the servant of society as a whole, not of a particular sect or party. Some, recognizing the teacher's power in this direction, have argued that he should eschew the use of suggestion altogether. But he could not if he would. Society places him in a position where he is bound, wittingly or unwittingly, to suggest ideas to his pupils. It is quite certain, moreover, that if he were to abdicate in this matter he would merely be leaving room in their minds for other, and possibly less desirable, suggestions.

In the opinion of Sir T. Percy Nunn,¹ the teacher is entitled to put

his superior knowledge and experience of life into the common stock from which the growing minds of his little community may draw each what it needs;

further, that he ought deliberately to suggest the "critical truth-seeking habit," and the "ideals sanctioned by the best and widest experience of mankind." With this wise view the conscientious teacher ought to be satisfied and the severest critic silenced.

Imitation proper, the 'doing' aspect of gregariousness, is the process in virtue of which all the members of a group act together. It too can take place with no more than two people, but its effects are clearest in a crowd where there is a leader to imitate. Although imitation seems to be a tendency common to us all, it cannot be called an instinct in the sense already defined, for there is no specific stimulus which calls it forth, nor any specific response in which it issues. What really happens when one person imitates another?

In unwitting imitation—the purest form—we always find another instinct at work. To begin with, the gregarious instinct is active, impelling the individual to join himself to others. Then, when he sees those others acting in an instinctive fashion, he, by the principle of primitive passive sympathy, not only experiences the appropriate emotion, but himself performs the instinctive action. Thus, if McDougall is correct in maintaining that one key to an instinct is the perception of similar instinctive action in others, we see that there is no need to postulate a special instinct of imitation. In unwitting imitation an instinctive action is performed by the imitator, the stimulus being a similar instinctive action in the person imitated; but the mediation between the two is indirect rather than direct.

Imitation of an action that is not instinctive cannot be entirely unwitting: it must involve some thought and deliberation. In witting or deliberate imitation *A*, having perceived something in *B*'s behaviour that he conceives to be desirable,

¹ *Education: its Data and First Principles*, p. 149.

sets about producing in himself a copy of *B*'s action. In this case he has not the action ready-made on an instinctive basis. He has a vague understanding of *B*'s action, which he analyses to some extent; then gradually, by a process of trial and error, he succeeds in acting in a similar manner. But any success that he achieves is, in the last resort, in virtue of his innate endowment: he must already be possessed of the bodily mechanisms which make success possible after perseverance. We read of the legendary Icarus, who attempted, with disastrous results, to imitate the flight of birds by fastening wings to his shoulders with wax. For long enough man has attempted to fly, but, not being endowed with wings, he has not been able to succeed by direct imitation. Being possessed, however, of a marvellous brain and a wonderful pair of hands, he has turned these to good account, and has at last imitated successfully by virtue of his own innate powers.

What place has imitation in education? Primitive education seems to have consisted almost solely in leading the child to imitate the useful arts of the tribe. But a conception of education as mere imitation of the arts and learning of the elders would lead to stagnation of art and science. This has been realized so clearly that some educators have condemned imitation altogether, on the grounds that it cramps originality. This, however, need not be so. "The most original minds find themselves only in playing the sedulous ape to others who have gone before them along the same path of self-assertion."¹ Wagner imitated the forms of the masters of opera before he developed his own original form of music-drama; and an Einstein must first imitate the thought of a Newton before he can advance upon it. So we need not be afraid to allow our pupils to imitate a good style of prose or a good form of any art; but we must prevent them from thinking that successful imitation is the highest end to be attained. Imitation is only the means to original self-expression. If we accept its aid we need not start absolutely from the beginning, for it short-circuits in a helpful way the process of racial recapitulation that we have already discussed.

¹ Nunn, *Education: its Data and First Principles*, p. 141.

Sympathy, suggestion, and imitation—the three manifestations of mimesis—are the chief factors operative in producing the crowd effect. To these Le Bon would add a sense or feeling of power. He says:

The individual, forming part of a crowd, acquires, solely from numerical considerations, a sentiment of invincible power which allows him to yield to instincts which, had he been alone, he would perforce have kept under restraint.¹

Feelings and actions normally inhibited are inhibited no longer; the individual feels that he can do as he pleases, and loses all sense of responsibility. Public bodies frequently come to stupid decisions which are beneath the level of intelligence of any one member, simply because no one assumes responsibility and leadership. Such stupid decisions are due to what has been called the law of fusion and arrest. When out of a number of individuals a new group-organism is formed and is not yet organized, it is only the mental characteristics that are common to all which fuse, while those that are peculiar to individuals arrest one another. When Le Bon tells us that

the decisions affecting matters of general interest come to by an assembly of men of distinction, but specialists in different walks of life, are not sensibly superior to the decisions that would be adopted by a gathering of imbeciles,²

his palpable exaggeration brings home this important truth. "The heterogeneous is swamped by the homogeneous,"² and it is only the highest common factor that counts. Now in any gathering of human beings whatsoever there is always a common measure of homogeneity—namely, the instincts. They will always tend to fuse, giving us the well-known phenomenon of mob-behaviour. Without leadership it is only the lowest interests that are held in common, and they reinforce one another from individual to individual according to the law of mimesis. To take a further example, when a gathering of men has no common intellectual, artistic, or athletic interest the conversation tends to sink to a deplorably low level.

¹ *The Crowd*, p. 33.

² *Op. cit.*, p. 32.

But so far we have been looking for reasons for the less desirable aspects of collective behaviour. A consideration of the various types of social group will convince us that collective behaviour need not always sink below individual behaviour. More than one classification is available, but for our purpose that of Drever¹ seems most helpful. First of all, we have the crowd type—a psychological group that has come together temporarily, only to dissolve soon. Its collective modes of thinking, feeling, and acting are transient; it has only a here-and-now consciousness, and it has no memories or sentiments as a group. It may be compared to an individual on the perceptual level of mental development; like a very young child or an animal, it merely follows the impulse of the moment. Secondly, we have the club type; that is to say, the social group that is typified by the club. It differs from the crowd inasmuch as it is held together, not merely by the temporary excitation of an instinct, but by the possession of some common interest, sentiment, or ideal powerful enough to weld its members into a collective organism. Compared with the crowd, it is a relatively permanent entity. Finally, we have the community type—the group which is held together by a comprehensive common purpose and which has continuity and permanence. The purpose must be sufficiently comprehensive, complex, and inclusive to enable individuals to achieve complete self-realization by taking aspects and phases of it as their own individual aims in life. A nation is, or ought to be, such a community. The community differs from the club in the width of its purpose: it represents not merely common interests and sentiments, but gathers together and focuses the whole life of its members.

With this classification of psychological groups before our minds, we may consider whether it is legitimate in any sense to talk of a group-mind. We have seen that the modes of action, feeling, and thought of a social group are different from those of the individuals who compose it. Ought we, then, to assume an entity behind collective behaviour and controlling it—a collective mind—just as we assume an

¹ *Introduction to the Psychology of Education*, p. 214.

individual mind behind individual behaviour? The question is difficult, if not unanswerable, since we cannot even say what an individual mind is. But if, following McDougall,¹ we define a mind, or rather paraphrase his notion of mind, as "an organized system of mental or purposive forces"; or, following Drever,² as "an organized and relatively permanent system of psychical forces and factors, manifesting itself in such phenomena as memories, ideas, sentiments," we may work out the question to some extent with regard to the crowd, the club, and the community.

Clearly the crowd has no such organized and relatively permanent system of purposive forces, no memories or sentiments; and we cannot attribute a mind to it in any useful sense. The club does have an organized system of purposes; it has certain memories and sentiments, and in it we have the beginnings of a mind in the McDougall-Drever sense. In the community we have a highly organized system of purposive forces; we have not merely common memories and sentiments, but common aims and ideals. The true community has even attained self-consciousness; it has realized itself and knows what it, as a community, is aiming at. To-day, indeed, the more advanced nations are tired of being the sport of fate and are becoming more and more determined to carve out their own destiny. Thus we can talk of the mind of a nation or of any other self-conscious community. Whether or not there is an ego in the case of the nation as there is, we believe, in the case of the individual, is a question which we gladly leave to metaphysics. In any case, the group-mind is not the sum-total or the average of the individual minds; the relation between the two is not so simple as that.

Now we recognize the desirability of cultivating a group-mind in our educational institutions when we extol, as we do, the tone, spirit, or *ethos* of a school. Boarding-schools are generally held to have a great advantage over day-schools in their power to establish a strong community spirit; the close corporate life of the former absorbs most of the energies and

¹ *Psychology*, p. 229.

² *Introduction to the Psychology of Education*, p. 214.

interests of the members, while the latter at their best are bound, from their very nature, to be no more than examples of the club type of social group. Certain conditions for the formation of the group-mind have been laid down,¹ and we shall do well to heed them in our efforts to make our schools into miniature communities.

First of all, there must be "some degree of continuity of existence of the group." This, as we have seen, does not obtain with the mere crowd. The continuity may be either material or formal; that is to say, either the same individuals must continue in association with one another, or the same system of generally recognized positions must continue, although occupied by a succession of different individuals. In schools and colleges we have both material and formal continuity, the former being ensured by the fact that the members actually continue together for several years and by the relative permanence of the staff, the latter by the established order of offices to be found in any well-conducted establishment. Clearly boarding-schools and resident colleges have a great advantage in respect of this first condition.

Secondly, it is essential to the formation of the group-mind that "in the minds of the mass of the members of the group there shall be formed some adequate idea of the group, of its nature, composition, functions, and capacities, and of the relations of the individuals to the group." That is to say, there must be a measure of group self-consciousness and a deliberate fostering of a group self-sentiment. Mere bodily presence in a group is insufficient: the members must be together in spirit. The listless, inattentive child contributes nothing at all to the class spirit, and the member of a school or college who never thinks of the group as a whole or seeks to further its aims and ideals is a drag on the community. Educators can do much to establish this favourable condition by keeping the aims and ideals of the community well before the minds of its members, and by encouraging them to do things as a group.

Thirdly, there must be "interaction of the group with other

¹ By McDougall in *The Group Mind* (pp. 49, 50).

similar groups animated by different ideals and purposes, and swayed by different traditions and customs." Such interaction fosters the development of the group self-consciousness which we have just been discussing, and it may take the form of co-operation, competition, or even conflict. It is a truism to state that nothing binds a nation together so much as an outbreak of war. We saw this very clearly in our own nation in 1914, and there can be no doubt that the German leaders committed a profound psychological error if they imagined that the questions of Ireland and Women's Suffrage would render this country an ineffective opponent. Now the conditions of school life lend themselves very readily to this interaction. Group feeling runs high when the school as a whole competes in any way with another school. In college the 'ragging' of one 'year' by another seems to promote a 'year' spirit which lasts for a lifetime; indeed, the favourite defence of organized 'ragging' is just that it does promote such a spirit. While rivalry and conflict can undoubtedly go too far and engender a group spirit that is undesirably narrow and exclusive, there can be no doubt that friendly rivalries between schools, forms, houses, and 'years' should be encouraged.

Fourthly, there must exist "a body of traditions and customs and habits in the minds of the members of the group determining their relations to one another and to the group as a whole." That is to say, there must be group-mneme—group-habits and group-memory. Tradition, no doubt, may easily become tyrannical and check desirable developments, but it is just as essential for the group-mind as memory is for the individual mind. Old-established foundations have a tremendous advantage in this respect, and it is wise to guard jealously their best traditions and even their harmless idiosyncrasies. New schools have at once to set about establishing traditions, a task which naturally takes time, and which cannot be successfully accomplished until after several years, when former members of the community return. Annual reunions and old boys' clubs are important means of establishing and preserving the group-memory.

Finally, there must be "organization of the group, consisting in the differentiation and specialization of the functions of its constituents." In particular, there must be a section set aside for formulating policy—for leadership, in other words. This last condition is of supreme importance if the mere crowd is to be transformed into a social group of the community type. We have just seen that the group-mind must manifest *motive*: it must also manifest *horme*, drive, or purpose. Now this purpose is always engendered in the minds of one or two outstanding members of the group, spreading from them to the group as a whole. This explains at once why a well-organized group, instead of sinking to the lowest levels of humanity, may manifest behaviour much superior to that of which the individual members are normally capable. The whole question is one of wise and effective leadership. No doubt crowd-leaders may be actuated by unworthy purposes, in which case the group as a whole will perform actions of which the individual members will afterward be ashamed; but when the leader is a man of high ideals he will get his followers to rise to his level. Thus a social group is capable of the heights of heroism as well as the depths of villainy. If the group is well led collective opinion may be superior to individual opinion, loyalty to the leader subordinating to itself all immediate and selfish ends. In community life leadership is all-important. It is a serious thing for a nation when there is a lack of vision and statesmanship among its leaders. Going even farther afield, we may say that it is only through inspiring leadership that the ideal of international brotherhood will become a reality.

How far does this last condition apply to the school? If we watch our pupils under conditions which permit of freedom and spontaneity, as in the playground and on the sports field, we may discover much of the nature and trend of the collective mind. In particular, we may note the appearance of the natural leaders, who must always be present if the group is more than a mere rabble. It is a commonplace to say that the leaders are not, as a rule, those who shine at intellectual work, but more often those who excel in physical strength,

skill in games, or even ingenuity in wickedness. And yet the discovery of the real leaders is not always a simple matter. It happens not infrequently that the apparent leader—a cheery, boisterous, muscular fellow—is only the puppet of a quiet person who likes to wield power without caring whether or not he has the appearance of doing so. We may readily enough find instances of such partnerships among our pupils.

Now we have seen that the purpose of a social group as a whole tends to assimilate itself to the purpose of its own natural leaders. This fact, however, frequently creates a difficulty in school, for there the dominant purpose which must be followed out is that of the teacher, who is the accredited representative of the wider society. Yet undoubtedly the class and the school work and play best under their own leaders. There may thus be a clash of the teacher's purpose with that of the group leaders. Can the teacher hope to solve the difficulty by himself assuming the rôle of natural leader of the school group? As a rule this is difficult, if only because of the difference in his age, experience, and position. Some teachers do attempt a solution on such lines, making themselves actual members of the group, playing games with their pupils, and co-operating with them in every possible way, seeking and occasionally finding the secret of perpetual youth. Certainly a young and popular master may do this, but every year the gap between him and his pupils is bound to widen, and the method become more and more difficult. The master is seldom accepted as leader by the rank and file of his pupils. A more hopeful line of solution is for him to become the leader of the leaders, to imbue them with his own purpose, to enlist their natural prestige and authority on his side. He should therefore give real responsibility to such leaders when he has found them, even although they may previously have been using their position against him. All real schemes of self-government are helpful in this connexion. The natural leaders will be elected as prefects, and, if wisely handled by the master, will be ranged on the side of law and order. They seldom betray the trust and confidence reposed in them, and readily

follow a tactful master, whose purpose then becomes the dominant purpose of the school-group.

We see how far these important considerations have led us from purely individual methods in education. Instruction in intellectual matters may best be carried on individually, but education in the wider sense needs the stimulus of group-life. Teachers, in their fight for smaller classes and in their adoption of individual methods, have had in mind chiefly the intellectual side of education, and many have failed to realize that for certain types of lesson the large class is not a hindrance, but a positive advantage. Dr F. H. Hayward, who since the War has strongly urged the importance of the feeling-life in education, has pointed out that, for successful lessons in inspirational subjects, one really needs a large class. We need have no difficulty now in discovering the reason: large numbers bring with them the possibility of a vigorous collective mind which will, by sympathy, suggestion, and imitation, become one with that of the teacher, catching his ideas and enthusiasms.

Now, of course, there is nothing surprising in such a contention. Preachers and orators would always rather speak to a large audience than to a small one; and their reason is not merely that, when they have something to say, they want as many people as possible to hear it. They cannot speak effectively to empty benches: numbers act as a positive stimulus. The speaker and his hearers act and react on one another: the audience actually contributes something of value, though it usually remains silent, and the resultant exaltation of feeling is a phenomenon of the collective mind.

Sir John Adams has pointed out that in education the doctrine of numbers is far from being new. David Stow, of Glasgow, early in the nineteenth century had special gallery class-rooms constructed, in which he gave 'gallery' lessons of an inspirational character. It was found that not every teacher had the requisite personality for giving successful lessons of this kind, also that those who did had to husband their strength lest their flame should be prematurely extinguished. 'Glasgow galleries' were a prominent feature in the older training colleges and practising-schools. At

Westminster College they have all been swept away: perhaps one at least might have been preserved. One still hears of the wonderful Bible lessons which were given in such a class-room, to half the school at a time, by Mr Samuel Brook, headmaster of the college practising-school.

Dr Hayward now tells us that these older masters of the art of teaching were perfectly right in using their large numbers to inspire enthusiasm and exalt feeling. The appreciation lesson in literature, music, or art is most successful when the teacher—a born leader—successfully infuses his own enthusiasm into the collective mind of a large class. Another opportunity comes in the morning assembly of the whole school, when the headmaster's main aim ought to be to stimulate his pupils to high endeavour throughout the day. One cannot over-emphasize the value of those occasions in school when collective feeling runs high. Prize-givings, Founders' Days, elections of prefects, sports meetings, and all sorts of celebrations should be regarded as opportunities for stimulating and strengthening the corporate life of the school, and should be deliberately planned with this object in view.

Educational theory has always oscillated between an individual and a social aim, and its perennial problem is to achieve a nice balance between the rival claims of the individual and the society to which he belongs. Now it is certainly true to say that the psychology of to-day is finding its proper line of advance in the exact study of individual differences, and that, in consequence, it is leading educators more than ever before to concentrate on the individual pupil. Nor can it be doubted that it is only by helping each one under our charge to realize his highest possibilities that we can hope to improve society as a whole. But it is equally important to remember that there is a large common measure of human nature which becomes most clearly manifest in social life. Educators, therefore, owe a debt of gratitude to those psychologists who have pointed out the conditions which must obtain if that social life is to be fostered and exalted. We should be seriously led astray if we pinned our faith solely to the psychology of the individual and aimed at pure individualism in

education. Broadly speaking, we ought to move toward the individual in matters intellectual, while in the moral sphere our most potent organ is the collective life of our schools. Only by making our schools into communities that are as near as possible to the ideal can we hope to train public-spirited citizens who, having caught in their youth a "vision splendid," "will not cease from mental fight" until they have "built Jerusalem in England's green and pleasant land."

SUGGESTIONS FOR FURTHER READING

McDOUGALL : *An Introduction to Social Psychology*, chapters iv and xv ; *The Group Mind ; Psychology*, chapter viii.

NUNN : *Education : its Data and First Principles*, chapters, i, x, and xv.

LE BON : *The Crowd*.

TROTTER : *Instincts of the Herd in Peace and War*.

ADAMS : *Modern Developments in Educational Practice*, chapters v and vi.

DREVER : *Introduction to the Psychology of Education*, chapter xi.

NOTE ON THE WORD 'INSTINCT' AS APPLIED TO HUMAN BEHAVIOUR AND ITS MOTIVES

THE word 'instinct' in psychology is inseparably associated with the name of Dr William McDougall, who has consistently taught that the behaviour of man is founded on instincts that are common to him and the higher animals. But the word has provoked needless controversy, and in a recent work¹ McDougall has thought it expedient to restate his doctrine in alternative terms. The difficulty has been that in common speech 'instinct' refers to a specific, stereotyped, innate mode of behaviour; and critics have maintained that, while the behaviour of the lower animals may lend itself to such a description, the behaviour of man certainly does not.

The distinguished author of *An Introduction to Social Psychology* never intended his readers to regard man's behaviour as a complex of certain stereotyped patterns that are innate. He sought rather to give expression to the view that man's activities are purposive, or, to use Nunn's term, *hormic*. In his latest exposition² he has reasserted that man from his very nature must strive to attain certain natural goals, but instead of using the word 'instinct' to describe this fact he employs the old terms 'propensity' and 'tendency.' A 'tendency'

¹ *The Energies of Men*.

² *Ibid*.

is the felt drive to do something, whereas a 'propensity' is the innate basis of that drive. Thus a tendency is "an active energy directed towards a goal," and a propensity is "any part of the innate constitution whose nature and function it is to generate upon occasion an active tendency." According to this usage, a tendency is a fact of experience, while a propensity is the fact of mental structure determining that experience: a tendency is a propensity in action, and a propensity is a latent tendency. The tendency is observed and the existence of the corresponding propensity is inferred.

We are, then, to believe that man is constituted so that he must actively pursue certain natural goals¹ the attainment of which satisfies his needs; and that the motive force of such activity lies in the innate propensities, which we might describe as specializations or differentiations of hormone.

Now, both animals and men are given the means of reaching these goals: they are endowed with various abilities which may be divided into two main classes—(a) abilities to perceive certain things, or perceptual abilities, and (b) abilities to perform certain actions, or motor abilities. The abilities are there in the service of the propensities, and it is fundamental to realize that the motives of behaviour are the latter, not the former. In the case of the lower animals each propensity is closely and exclusively linked with or geared to special perceptual and motor abilities, resulting in a stereotyped mode of behaviour under certain environmental conditions: such behaviour is by common consent spoken of as 'instinctive.' But in man there is little trace of any such special relations; it is difficult to find any train of activity that is the peculiar expression of one propensity. Man is free to utilize any or all of his abilities in attaining the goals of his propensities, which are recognizable only through the nature of these goals.

If by instinctive behaviour we mean the pursuit of certain natural goals, then man's behaviour may be described in terms of instinct; if, on the other hand, by instinctive behaviour we mean certain stereotyped, predetermined activities, then man's behaviour may not be so described. Since the words 'instinct' and 'instinctive' seem to have the latter meaning so firmly attached to them, we should do well to avoid their use and state the doctrine in terms of propensities, tendencies, and abilities. The present writer, however, maintains his unshakable conviction that it is of the very essence of human nature to strive towards certain goals in common with all other members of the human species.

¹ These natural goals are indicated at pp. 59-62 of the present work.

INDEX

- ABNORMAL development, 155 *et seq.*
 Accidents, Freudian view of, 162
 Acquired characteristics, inheritance of, 76, 82, 84-87, 90
 Acquisition, instinct of, 61, 64, 70, 166, 167
 Adams, Sir John, 9, 12, 14, 16, 20, 85, 95, 113, 117, 183, 221, 230, 240, 263, 265
 Adaptation to environment, 90, 144, 147
 Adolescence, 73, 139, 146-154, 155, 161, 163-168; delinquencies of, 164-168
 Æsthesiometer, 225
 Affect, 33, 34, 35, 39, 40, 41, 42, 65, 68, 72
Alter ego, the, 107, 108
 Alternating personalities, 158
 Altruism, 145, 150
Ammophila, 47
 Amœba, 57-58
 Amusement, 64, 175
 'Analogies' test, 209
 Analysis and synthesis, 202, 203, 204, 207
 Analytic type, the, 242
 Anarchic doctrine of intelligence, 234, 236
 Anger, 13, 63, 64, 65, 69
 Anthropomorphism, 40, 42, 125
 Appeal, instinct of, 62, 64
 Apperception, 49, 210
 Appetitive tendencies, 60, 61
 Appreciation, 72-75, 217, 264
 Apprehension of experience, 33, 42, 44, 47, 124, 184
 Archetypes, 204
 Aristotle, 81, 104
 Arithmetic, teaching of, 100, 203
 Armstrong, Professor H. E., 94, 114
 Ascham, Roger, 241, 246, 247
 Association of ideas, 48
 Associationist school, 48, 49
 Attention, 69, 169-182; enforced, 174, 175, 176; non-volitional, 174, 175, 176; spontaneous, 174, 175, 176, 177; volitional, 174, 175, 176, 177, 182, 187, 226; span of, 178; continuity of, 178-179; division of, 179
 Auto-erotism, 142, 148
 Automatism, 161
 Autonomy, 26
 Aveling, Dr F. A. P., 203, 218
 Awareness, 32, 33, 42, 44

 BALLARD, DR P. B., 51, 100, 192, 193, 194, 195, 220, 223, 225, 230, 231, 240
 Barnardo Homes, 91
 Barrie, Sir James, 12, 109, 158
 Beautiful, the, 72-75
 Behaviour, 13, 14, 15, 16, 19, 21, 23, 24, 27, 29, 31, 56, 248; social, 71, 145, 151
 Behaviourists, 14, 29, 33, 66, 118, 119, 120, 200
 Bergson, Henri, 46, 88, 95, 186
 Binet, Alfred, 226-228, 233, 240
 Biological utility, 102, 103, 105, 106
 Biology, contribution of, to psychology, 76 *et seq.*
 Board of Education, the, 154, 223, 240
 Boarding-schools, 258, 259
 Bodily accompaniments of emotion, 65-66

- Body-sentiment, 142
 Branford, Benchara, 93-94, 95
British Journal of Psychology, 86, 139, 192, 237, 238
 Brock, A. Clutton, 75
 Brook, Samuel, 264
 Brown, Dr William, 67
 Bryan and Harter, 136
 Buffon, 81
 Burnet, Professor John, 104
 Burt, Professor Cyril, 166, 168, 211, 223, 228, 240
 Butler, Samuel, 46, 88, 95

 CATHARSIS, 104, 105, 106, 108, 110, 112, 215
 Cathartic theory of play, 104-105, 106, 107
 Cause and effect, 24
 Censor, the Freudian, 159
 Central schools, 152
 Character, 16, 69, 70, 129, 130, 131, 132, 177, 182, 237
 Characteristics, acquired, inheritance of, 76, 82, 84-87, 90; dominant and recessive, 78-80
 Child, the average, 239, 241
 Child-study movement, 12, 13
 Childhood, Victorian view of, 11; stages of, 139-146
 Christianity, 128
 Christopher Robin, 109
 Classes, large and small, 246, 263-264
 Clearness in teaching, 170
 Club type of social group, 257, 258
 Co-education, 246-247
 Cognition, 33, 34, 35, 39, 40, 41, 42, 170, 179, 196; laws of, 33, 96, 177, 178, 184, 208, 209
 Cognitive dispositions, 196, 202, 204, 208, 210
 Cohesion, 48-50, 123
 Collective psychology, 17, 248 *et seq.*
 Colleges, residential, 259
 Collins, Mary, 183, 195
 Combat, instinct of, 59-60, 62, 63, 64, 105
 Community spirit in schools, 258-262
 Community type of social group, 257, 258
 Compensation, 108
 Complexes, 49, 50, 51, 52, 55, 56, 120, 121, 157, 158, 159, 160, 161, 162
 Conation, 33, 34, 35, 39, 40, 41, 42, 47, 48, 74, 75, 170, 179
 Concepts, 202-204, 207
 Conceptualism, 201
 Conditioned reflex, 118, 119
 Consciousness, 29, 32, 33, 38, 39, 155, 186
 Conservation, 43-44
 Consolidation, 50-53, 135, 136, 144, 151, 189, 192
 Construction, instinct of, 61, 62, 64, 69
 Contiguity, 49
 Continuity of attention, 178-179
 Continuity of interest, 49
 Continuity of the germ-plasm, 77
 Conversion, religious, 150
 Cook, H. Caldwell, 112, 117
 Copernicus, 22
 Correlates, education of, 208, 209, 210, 211, 212, 226
 Correlation, 223-224, 235, 236
 Creativeness, 64, 74, 96, 98, 99, 101, 112, 115, 116
 Crichton-Miller, Hugh, 168
 Crowd type of social group, 257, 258
 Culture epochs, 93
 Curiosity, 60, 64, 69, 71
 Curriculum, the, 153

 DALTON PLAN, the, 113, 115, 246, 247
 Darwin, Charles, 81, 82, 83, 84, 88, 89, 95

- Darwin, Erasmus, 81
 Davies, Sir H. Walford, 73
 Day-dreams, 163, 164, 166, 215
 Deep-narrow type, 242, 244
 Defence mechanisms, 162-163
 Delinquencies of adolescence, 164-168
 Dependence, 140, 149-150, 164
 Descartes, 25, 31
 Development, 118 *et seq.*, 139 *et seq.* ; abnormal, 155 *et seq.*
 Dewey, Professor J., 218
 Dickens, 11, 166
 Didactic apparatus, 213, 214
 Discipline, 100-101
 Disgust, 60, 64
 Dispositions, 29, 37-38, 39, 46, 53-54, 55, 56, 59, 118, 121, 122, 156, 170, 172, 173, 184, 185, 186, 187, 188, 189, 191, 194; cognitive, 196, 202, 204, 208, 210
 Dissociation, 158
 Distraction, 180
 Distress, 64
 Distributive type, the, 180, 181, 242
 Dominant characteristics, 78-80
 Dotting-machine, 226
 Dreams, 158, 160-161
 Drever, Dr James, 14, 16, 20, 32, 39, 41, 42, 48, 53, 54, 67, 68, 75, 117, 138, 171, 172, 183, 195, 199, 211, 218, 243, 257, 258, 265
 Drudgery, 99, 176
 Dualism, 28
 Ductless glands, 129
 Dynamic type, the, 181, 182, 242
 Dynamometer, 225
 EBBINGHAUS, HERMANN, 191
 Eclectic doctrine of intelligence, 236
 Economy in learning, 189
 Eddington, Sir A. S., 204
 Educability, 71
 Education, aim of, 14, 15-16, 264
 Educational visits, 214
 Eidetic type, the, 242
 Einstein, Albert, 123, 255
 Élan-vital, 46, 60
 Elation, 141
 Eliot, George, 11
 Emotion, 63 *et seq.*, 104, 105, 121, 142, 147, 237, 250; tender, 64; bodily accompaniments of, 65-66
 Endopsychic process, 48, 156 *et seq.*
 Enforced attention, 174, 175, 176
 Engrams, 46, 48, 49, 50, 51, 120, 156
 Environment, 76, 81, 83, 88, 91; adaptation to, 90, 144, 147; social, 126, 140, 145
 Ergograph, 225
 Escape, instinct of, 60-61, 64, 67, 87
 Evolution, 57, 63, 76 *et seq.*
 Experience, 11, 25, 30-35, 36, 37, 38, 39-42, 45, 121, 155, 156, 160, 173, 184, 243; subject of, 30-31; object of, 31, 172, 196, 197, 199, 201; modes of, 33-35; apprehension of, 33, 42, 44, 47, 124, 184; learning by, 45
 Experiment, 17, 29
 Experimental psychology, 18, 19, 73, 135-138, 177-182, 186-194, 203, 220-238, 241, 242
 Extroversion, 146, 243-244, 245, 246
 FACT and fancy, 110-111, 216-217
 Faculties, 43, 62, 169, 225, 233-234, 236
 Faculty psychology, 43, 130
 Fairy-tales, 109-111, 215-216
 Fantasy, 107-109, 140, 147, 166, 215, 216
 Farce, 104
 Father-sentiment, 142-143
 Fatigue, 180, 192, 194
 Fear, 63, 64, 65, 67, 69; morbid, 162
 Feeling, 33, 34, 35, 39, 40, 41, 42, 68, 72, 73, 121; of 'worth-whileness,' 41, 53, 68

- Fixating type, the, 181, 242
 Fixation, 164
 Fluctuating type, the, 181, 242
 Flügel, Dr J. C., 168
 Food-seeking, instinct of, 59, 60, 61, 63, 64
 Forgetting, 146, 148, 160, 162, 186, 190-194
 Freud, Sigmund, 47, 61, 71, 140, 142, 143, 155, 156, 159, 161, 162, 168, 191
 Froebel, 114
 Fuller, Thomas, 9
 Fusion and arrest, law of, 256

 GALL, F. J., 222
 Galton, Sir Francis, 77, 84, 91, 223, 224
 Games, 149, 163
 Gang spirit, 145-146, 167
 Garnett, Dr Maxwell, 238
 Geddes, Professor Patrick, 77, 78, 80, 86, 89, 91, 95
 General factor in intelligence, 235-236
 Geography, teaching of, 115
 Geometry, teaching of, 94
 Germ-cell, 77, 78, 86
 Germ-plasm, continuity of the, 77
 Germinal segregation, theory of, 78, 85, 86
 Gesture, 205-206
 'Glasgow galleries,' 263
 Goethe, 81, 93
 Grammar schools, 153, 240
 Green, G. H., 117, 168
 Gregarious instinct, 58, 61, 63, 64, 67, 70, 71, 144-145, 151, 250, 252, 254
 Groos, Karl, 102, 103, 105, 107, 117
 Group factors in intelligence, 236
 Group memory, 260
 Group mind, 257-261
 Group psychology, 17, 248 *et seq.*
 Group tests, 229-230

 HABIT, 86, 87, 96, 118-120, 122, 134-138
 Habit memory, 186
 Hadfield, J. A., 168
 Hadow Report, 152-154
 Haeckel, 82
 Hall, Professor Stanley, 92, 95, 97, 103, 104, 105, 106, 107, 112, 117, 144, 154
 Hart, Bernard, 168
 Hartmann, 38
 Hate, 122, 127, 142
 Hayward, Dr F. H., 75, 90, 95, 263, 264
 Hegel, 93
 Herbart, J., 17, 49, 90, 91, 93, 210
 Herd impulse, 58
 Heredity, 76 *et seq.*; social, 85
 Hero-worship, 149-150, 151
 Heterosexuality, 142, 148
 Heuristic method, 94, 113, 114
 Hingley, R. H., 168
 History, teaching of, 115
 Hobbies, 114, 121, 176, 182
 Höfding, Professor Harald, 20, 42
 Homosexuality, 142, 148
 Hooliganism, 167
 Horme, 46-48, 55, 57, 58, 62, 82, 88, 142, 155, 156, 261
 Huxley, 21, 88
 Hypnosis, 252
 Hypostatization, 28, 35, 43, 48, 49, 65, 197, 209
 Hypotheses, psychological, 21-42, 48, 119, 159
 Hypothesis, the identity, 28

 IDEAL self, 128
 Ideals, 128, 129, 130, 132, 151
 Identity hypothesis, 28
 Imagery, 186, 199-200, 212; types of, 242-243
 Imaginary companions, 107-108, 110
 Imagination, 140, 147, 166, 199 *et seq.*; training of, 214-218

- Imaginative thinking, 199 *et seq.*
 Imitation, 74, 96, 107, 126, 250, 254-255, 256
 Individual differences, 241-247, 264
 Individual work, 134, 181, 239, 246, 247, 248, 263, 265
 Individuality, 15, 132, 250
 Infancy, 139-143
 Infant schools, 152
 Innate ideas, 204
 Inspirational lessons, 263
 Instinct, 55 *et seq.*, 76, 87, 96, 102, 105, 106, 107, 112, 118, 119, 120, 121, 129, 130, 131, 140, 166, 171, 173, 174, 175, 176, 182, 251, 254, 256; of self-assertion, 52, 61, 63, 64, 71, 98, 99, 100, 107, 140, 165, 250; of gregariousness, 58, 61, 63, 64, 67, 70, 71, 144, 145, 151, 250, 252, 254; of food-seeking, 59, 60, 61, 63, 64; of combat, 59-60, 62, 63, 64, 105; parental, 59, 63, 64, 71; of escape, 60-61, 64, 67, 87; of repulsion, 60, 64; of curiosity, 60, 64, 69, 71; of construction, 61-62, 64, 69; of mating, 61, 63, 64; of self-abasement or submission, 61, 63, 64, 69, 71, 141, 250, 253; of acquisition, 61, 64, 70, 166, 167; of appeal, 62, 64; of laughter, 62, 64; definition of, 64
 Instinct-interest, 41, 172
 Intelligence, 70, 102, 103, 219-240; metric scale of, 226-228; monarchic doctrine of, 232-233, 236; oligarchic doctrine of, 233-234, 236, 242; anarchic doctrine of, 234, 236; doctrine of two factors in, 235-236; general factor in, 235-236; specific factors in, 235-236; eclectic doctrine of, 236; group factors in, 236
 Intelligence quotient, 228-229, 230, 232, 238, 239
 Intelligence tests, 140, 219-240
 Intensive type, the, 180, 181, 242
 Interaction, theory of, 28
 Interest, 34, 41, 50, 52, 72, 99, 136, 138, 169 *et seq.*, 186, 188, 190, 191, 194; continuity of, 49
 Interviews, 237-238
 Introspection, 11, 17-19, 38, 155, 179
 Introspective psychology, 11, 12, 13, 33, 155
 Introversion, 147, 163, 243-244, 245, 246
 JAMES, WILLIAM, 11, 18, 65, 66, 70, 75, 92, 130, 138, 183, 190, 195
 James-Lange theory, the, 65, 66
 Johnson, Dr Samuel, 232-233
 Jones, Dr Ernest, 139, 140, 147, 154
 Jung, Carl, 161, 168, 204, 237, 243, 244, 247
Just So Stories, 98
 KELLER, HELEN, 214
 Kepler, 123, 212
 Kindergarten, the, 114
 Kipling, Rudyard, 98, 244
 Knowing, 33, 34, 35, 39, 40, 41, 42, 196
 Knowledge, 16, 17, 196, 219, 220, 221
 LAMARCK, 46, 81, 82, 83, 84
 Lamarckism, 85, 86, 88, 89, 91
 Language, 125, 205-208
 Laughter, 62, 64
 Lavater, 222
 Lawlessness, 164
 Le Bon, Gustave, 249, 256, 265
 Leadership, 261, 262
 Learning, by experience, 45; plateaux in, 135-137; by rote, 186; economy in, 189
 'Learning and saving' method of memory-testing, 187, 191
 Learning periods, distribution of, 189

- Left-handedness, 161
 Libido, 46, 142, 155
 Life, characteristics of, 26-27
 Life-urge, the, 46
 Literature, teaching of, 94
Little White Bird, The, 12, 109
 Living organism, nature of, 24-27
 Lloyd Morgan, C., 39
 Locke, John, 17
 Lombroso, Cesare, 222
 Loneliness, 64, 67
 Love, 122, 127, 142
 Low, Barbara, 168
 Lucretius, 216
 Lust, 64
 Lying, 165-166
 Lynch, A. J., 117

 MACBRIDE, PROFESSOR E. W., 76,
 78, 84, 88, 89, 91, 95
 McDougall, Professor William, 17,
 19, 20, 22, 27, 36, 38, 42, 43, 46,
 47, 54, 58, 59, 60, 62, 63, 64, 67,
 68, 70, 75, 86, 87, 90, 96, 106, 117,
 118, 120, 121, 124, 127, 128, 130,
 138, 140, 155, 168, 170, 171, 172,
 173, 179, 180, 183, 184, 190, 195,
 196, 218, 226, 247, 249, 251, 254,
 258, 259, 265
 MacMunn, Norman, 114, 117
 Magson, Dr E. H., 237
 Make-believe, 107, 110, 141, 147,
 163
 Malebranche, N., 102
 Mannerisms, 161
 Master-sentiment, 123-124, 131, 157,
 174
 Mathematics, 19; teaching of, 72,
 94, 115, 176, 177, 217
 Mating, instinct of, 61, 63, 64
 Maturity, 139, 151-152, 155
 Meaning, 41, 49, 53-54, 186, 190,
 209-210, 243; primary, 41, 53
 Mechanical action, 23, 24, 27
 Mechanists, 25, 40, 42
 Memories, special, 188
 Memorizing, 187-189, 190; methods
 of, 188-189
 Memory, 44, 184 *et seq.*, 210; habit,
 186; true, 186; span of, 187;
 training of, 189-190; group, 260
 Mendel, 78-80
 Mental age, 228, 231
 Mental conflict, 58, 104, 155 *et*
 seq.
 Mental measurement, 219 *et seq.*
 Mental structure, 19, 29, 36-39, 40,
 44, 46, 48, 53, 55, 59, 120, 121,
 156, 159, 172, 173
 'Merely reactive' type, the, 242
 Method, the heuristic, 94, 113, 114;
 the project, 113; the Montessori,
 113, 114, 117, 213-217, 218, 246
 Metric scale of intelligence, 226-
 228
 Meumann, E., 188, 242
 Milne, A. A., 109
 Mimesis, 250, 256
 Mind, 10, 14, 27, 28, 36; and
 body, 27-28, 92, 186, 197, 221,
 222, 223, 224
 Mneme, 44-45, 48, 55, 184, 185,
 260, 261; racial, 45
 Modern schools, 153, 240
 Modes of experience, 33-35
 Monarchic doctrine of intelligence,
 232-233, 236
 Monism, 28
 Montessori Method, 113, 114, 117,
 213-217, 218, 246
 Moodiness, 164
 Moral culture, 69, 104, 145, 146,
 151
 Moral sentiments, 127-128, 129, 130,
 131, 132
 Morbid fears, 162
 Mother-sentiment, 142, 143, 148
 Motives, 16, 63, 69
 Motor tests, 225, 226
 Multiple types, theory of, 242
 Music, teaching of, 94
 Mutations, 84

- NAMES, psychological aspect of, 206
 Narcissism, 142
 Natural selection, 84, 88, 89
 Negative self-feeling, 64, 141
 Neill, A. S., 117
 Nervous system, 41, 119
 Newton, Sir Isaac, 123, 212, 232, 255
 Nominalism, 201
 Non-volitional attention, 174, 175, 176
 Nonsense-syllables, 44, 49, 185, 186-187, 191
 Normal distribution, law of, 245
 Numbers, use of, 220
 Nunn, Sir T. Percy, 15, 17, 26, 42, 44, 46, 47, 48, 52, 54, 68, 75, 91, 94, 95, 96, 101, 106, 115, 117, 127, 138, 145, 154, 186, 195, 202, 205, 218, 246, 247, 250, 254, 255, 265
 Nursery schools, 152

 OBJECTIVE type, the, 242, 244
 Objectivity, 18-19, 220
 Obliviscence, 192-194
 Observation in psychology, 17
 Ockham, William of, 201
 Œdipus complex, 142-143
 Oligarchic doctrine of intelligence, 233-234, 236, 242
 Omissions, Freudian view of, 162
 Order in school, 100
 Organic resonance, 65-66
 Original sin, 164
 Originality, 255
 Ownership, 64

 PAIDOCENTRIC tendency in education, 113
 Parallelism, doctrine of, 92-95; psycho-physical, 28
 Parental instinct, 59, 63, 64, 71
 Parkhurst, Helen, 117
 Patrick, Professor G. T. W., 27, 30, 42, 95
 Pavlov, I. P., 119
 Pearson, Professor Karl, 223, 224
 Perception, 210
 Perceptual thinking, 197-199
 Performance tests, 230
 Perseveration, 187-188, 242
 Persistence of motives, 238
 Pestalozzi, 9, 10, 11, 13, 14
 Peter Pan, 12, 108, 109, 158
 Philosophy, 15, 28
 Phrenology, 222
 Physiognomy, 222
 Plateaux in learning, 135-137
 Plato, 72, 73, 93, 201
 Play, 96 *et seq.*; surplus energy theory of, 101, 105, 106; practice theory of, 102-103; reminiscent theory of, 103-104, 105, 106; cathartic theory of, 104-105, 106, 107
 'Play-way,' the, 112-117
 Pleasure and interest, 175
 Positive self-feeling, 64, 72, 98, 99, 107, 141
 Post-hypnotic suggestion, 252
 Post-primary schools, 152-154, 240
 Practical work, 153, 214, 217
 Practice, 53, 98, 137-138
 Practice theory of play, 102-103
 Preconscious, the, 159
 Prefects, 113
 Primary meaning, 41, 53
 Primary schools, 152, 153
 "Primitive passive sympathy," 251
 Prince, Morton, 122
 Pritchard, F. H., 75
 Project method, 113
 Projection, 104, 108, 125, 126
 Prompting method of memory-testing, 187
 Prudery, 163
 Psychic energy, 105, 106, 157, 160, 163, 170, 178, 179, 180, 226, 237
 Psychical, the, 14, 21
 Psychical integration, 41, 243
 Psychical object, the, 31, 172, 196, 197, 199, 201

- Psycho-analysis, 17, 19, 38, 57, 139,
 142, 155-168, 215, 237
 Psycho-galvanic reflex, the, 237
 Psycho-physical problem, the, 28
 Psychological study, methods of,
 17-19
 Psychology, definition of, 10, 13-14,
 29, 248; introspective, 11, 12, 13,
 33, 155; collective, 17, 248-265;
 group, 17, 248-265; experi-
 mental, 18, 19, 73, 135-138, 177-
 182, 186-194, 203, 220-238, 241,
 242; faculty, 43, 130
 Ptolemy, 22
 Puberty, 142, 152
 Punishment, 167
 Purpose, 24, 27, 120
 Pyle, W. H., 137

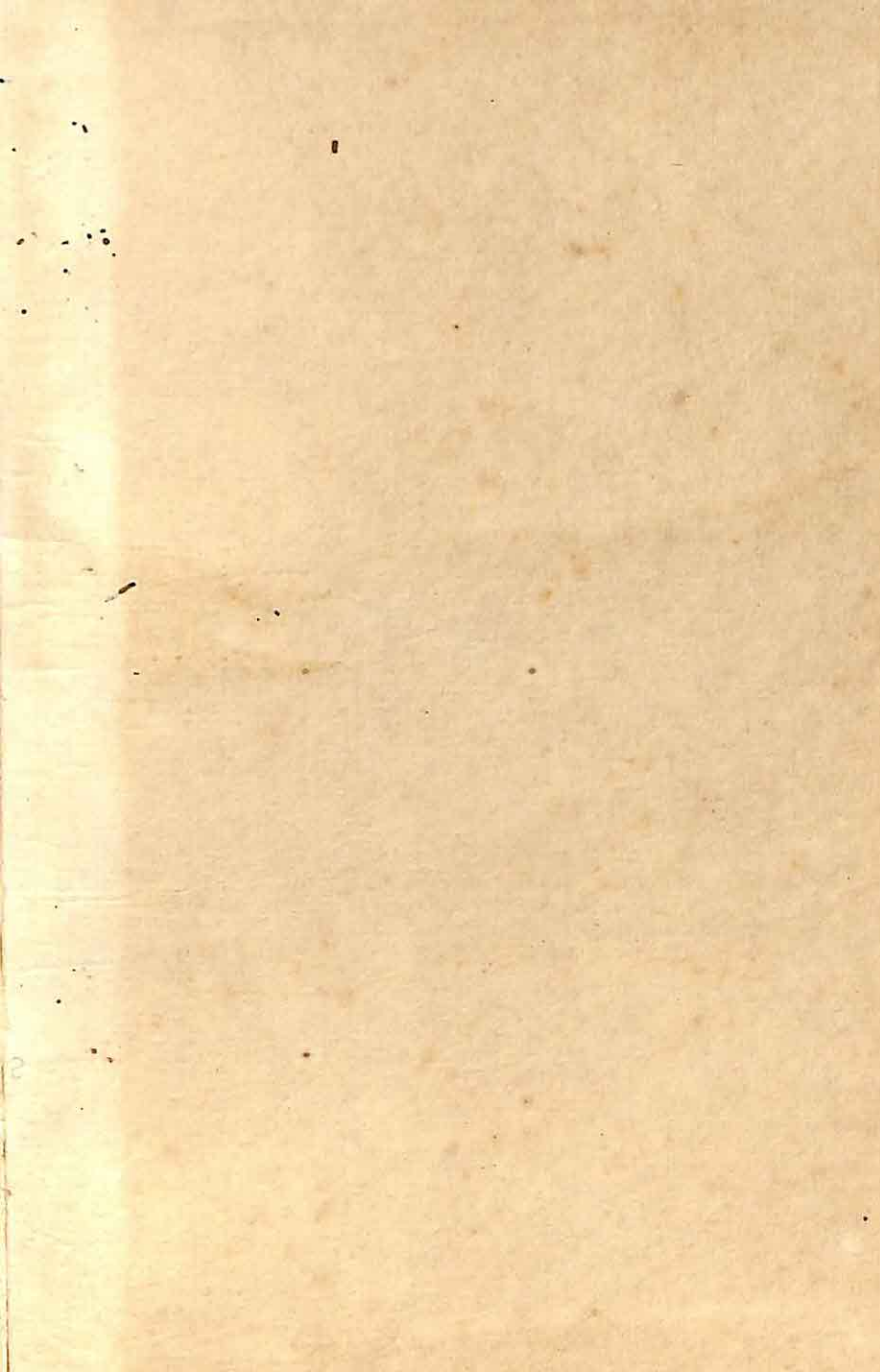
 QUINTILIAN, 9

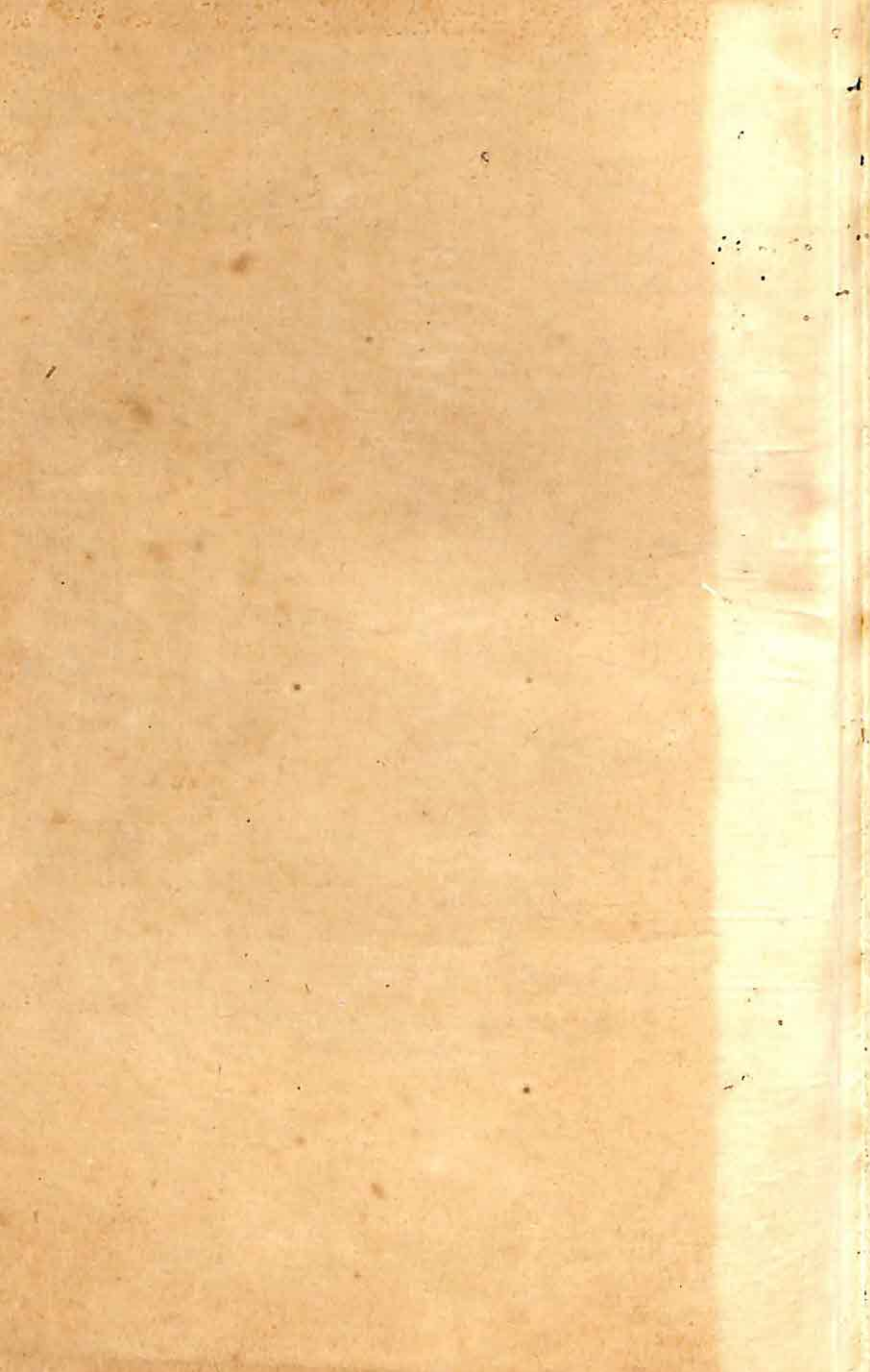
 RACE-PRESERVATION, 57, 58
 Racial mneme, 45
 Ragging, 260
 Rationalization of motives, 167
 Reaction formations, 162-163
 Reaction time, 225, 237
 Reactive tendency, 60, 61
 Read, S., 154, 168
 Realism, 201
 Reasoning, 211-212, 217
 Recapitulation, doctrine of, 91-95,
 103-104, 113, 139, 144, 146, 147,
 218, 255
 Recessive characteristics, 78-80
 Recognition, 44, 185
 Rees, Dr J. R., 168
 Reflex action, 119
 Reflex, conditioned, 118, 119
 Regression, 164, 215
 Relations, education of, 184, 185,
 208-209, 210, 211, 212, 226
 Religion, 150
 Reminiscence, 51, 192-194
 Reminiscent theory of play, 103-
 104, 105, 106
 Repetition, 96-101, 120
 Repetition-compulsion, 140
 Repression, 71, 147, 159-168, 191,
 215
 Repulsion, 60, 64
 Response, 24, 26
 Rest, intervals of, 53
 Retention, 186, 187, 188, 190, 191
 Reversion to type, 80
 Rhythm, 97
 Rivers, Dr W. H. R., 67, 75
 Roscoe, Frank, 206
 Rousseau, 213
 Routine, 96-101
 Rover movement, the, 116-117
 Rusk, Dr R. R., 20, 137, 138, 183,
 188, 195, 215, 218, 240, 247

 SANDIFORD, PETER, 20, 75, 95, 138,
 240
 Scepticism, 150
 Schiller, 101
 Scholarship examinations, 229, 240
 School journeys, 115, 214
 Schoolboy morality, 146
 Schoolmen, the, 201
 Schools, central, 152; infant, 152;
 nursery, 152; primary, 152, 153;
 secondary, 152, 153; post-pri-
 mary, 152-154, 240; grammar,
 153, 240; modern, 153, 240;
 boarding, 258, 259; community
 spirit in, 258-262
 Science, teaching of, 94, 114
 Scoring method of memory-testing,
 187
 Scout movement, the, 116, 146, 147
 Secondary personalities, 158
 Secondary schools, 152, 153
 Selection, 171, 197; natural, 84, 88, 89
 Self, the ideal, 128
 Self-abasement, 61, 69, 71, 250
 Self-assertion, 52, 61, 63, 64, 71, 98,
 99, 100, 107, 140, 165, 250
 Self-consciousness, 124-127, 258,
 259, 260

- Self-control, 151
 Self-government, 113-114, 134, 262
 Self-love, 142, 148
 Self-preservation, 57, 58
 Self-regarding sentiment, 124, 127,
 130, 131, 133, 156, 157, 159, 174,
 176, 182
 Self-respect, 131, 174, 177
 Sensation, 197, 198, 199, 209, 224
 Senses, 197-198, 213, 214
 Sense-organs, 197-198
 Sense-training, 213-214
 Sensory tests, 224-225, 226
 Sentimentality, 133
 Sentiments, 118, 121-124, 132, 133,
 142, 173, 174, 175, 176, 177, 182;
 moral, 127-128, 129, 130, 131, 132
 Sex, 57, 58, 61, 71, 141-142, 147-
 149, 150, 151, 155, 163, 165, 166,
 247
 Shakespeare, 248, 252
 Shallow-broad type, 242, 244
 Shand, A. F., 138
 Shaw, George Bernard, 46, 80, 81,
 86, 95
 Simpson, J. H., 117
 Skill, 50, 52, 134-138
 Slaughter, J. W., 148, 154
 Slips, Freudian view of, 162
 Smith, M., 190
 Social behaviour, 71, 145, 151
 Social environment, 126, 140, 145
 Social heredity, 85
 Somnambulism, 161
 Span, law of, 177-180
 Span, of attention, 178; of memory,
 187
 Spatial threshold, 224-225
 Spearman, Professor C., 33, 43, 96,
 177, 183, 184, 195, 203, 204, 207,
 208, 218, 230, 231, 232, 233, 234,
 235, 236, 237, 240, 247
 Special memories, 188
 Specific factors in intelligence, 235-
 236
 Spencer, Herbert, 92, 93, 101
 Spontaneity, 23, 112
 Spontaneous attention, 174, 175,
 176, 177
 Spontaneous type, the, 242
 Spurzheim, J. C., 222
 Stammering, 161
 Stanford scale, the, 228-229, 230,
 231
 Static type, the, 181, 182, 242
 Stealing, 166
 Stern, W., 242
 Stevenson, R. L., 145, 158
 Stigmata, bodily, 222
 Stout, Professor G. F., 11, 20, 34, 38,
 42, 43, 49, 65, 172, 183
 Stow, David, 263
 Stream of consciousness, 35, 170
 Striving, 33, 34, 35, 39, 40, 47, 170,
 179
 Subconscious, the, 33
 Subject of experience, 30-31
 Subjective type, the, 242, 244
 Subjectivity, 18, 221
 Sublimation, 71, 107, 114, 148, 149,
 151, 166, 167
 Submission, instinct of, 61, 63, 64,
 71, 141, 250, 253
 Suggestion, 74, 96, 250, 251-254,
 256; post-hypnotic, 252
 Surplus energy, 101, 105, 106, 149
 Survival of the fittest, 83, 84, 88, 89
 Swift, E. J., 136
 Symbols, 160
 Sympathy, 62, 74, 96, 250-251,
 256; primitive passive, 251
 Synthetic type, the, 242
 TACHISTOSCOPE, 178
 Tansley, A. G., 168
 Tapping-machine, 225
 Taste, 72-75
 Team systems, 113
 Telepathy, 250-251
 Temperament, 129, 237
 Tendencies, appetitive and reactive,
 60, 61

- Tender emotion, 64
 Terman, Professor L. M., 228, 229, 240
 Tests, intelligence, 140, 219-240 ; sensory, 224-225, 226 ; motor, 225, 226 ; group, 229-230 ; performance, 230
 Tetrad equation, 235, 236
 Thinking, 196-218 ; perceptual, 197-199 ; imaginative, 199 *et seq.*
 Thomson, Professor G. H., 230
 Thomson, Professor J. Arthur, 77, 78, 80, 86, 89, 91, 95
 Thorndike, E. L., 52, 245
 Time-tables, school, 100
 Titchener, E. B., 170
 Tradition, 260
 Tragedy, 104
 Training, in skill, 134-138 ; of memory, 189-190 ; of the senses, 213-214 ; of will, 132-134 ; transfer of, 213, 225 ; of imagination, 214-218
 Transfer of training, 213, 225
 Transitoriness, law of, 70, 92
 Trial and error, 52, 136, 255
 Trotter, W., 249, 265
 Truancy, 165
 True memory, 186
 Two factors, doctrine of, 235-236
 Type, distributive, 180, 181, 242 ; intensive, 180, 181, 242 ; dynamic, 181, 182, 242 ; static, 181, 182, 242 ; fixating, 181, 242 ; fluctuating, 181, 242 ; analytic, 242 ; 'deep-narrow,' 242, 244 ; 'merely reactive,' 242 ; spontaneous, 242 ; synthetic, 242 ; objective, 242, 244 ; shallow-broad, 242, 244 ; subjective, 242, 244
 Types of imagery, 242-243
 Types, theory of multiple, 242
 UNCONSCIOUS, the, 19, 29, 33, 38-39, 155-156, 157, 158, 159
 "Unity in diversity," 26, 123
 Universals, 201
 VITAL principle, 46
 Vitalism, 25
 Volitional attention, 174, 175, 176, 177, 182, 187, 226
 Vries, Professor Hugo de, 84
 WARD, H., 206
 Webb, Dr E., 238
 Weismann, August, 77, 85, 86, 90
 Welton, J., 20
 Westminster College, 204
 Whitehead, Professor A. N., 219
 Will, 129-131, 151, 174, 176, 177, 180, 182, 217 ; training of, 132-134
 Will-to-live, 46
 William of Ockham, 201
 Winch, W. H., 189
 Wisdom, 219, 220
 Wonder, 64, 71, 72
 Word-association, 158, 237
 Words, 205-208
 Wordsworth, 202
 Worry, 161
 YOAKUM and Yerkes, 240
 ZEAL, excessive, 162
 Ziller, 93





11

12

13

14

15

16

17

18

19

20

21

22

